Infant Care and Management

Maynard

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BELFAST.

INFANT CARE AND MANAGEMENT.

A Manual for Teachers

BY

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PREFACE.

THE last few years have seen a large increase of interest, among all classes of public workers, in the question of the reduction of our high infant mortality rate.

Not least among those interested are school teachers, who feel, and feel rightly, that they, too, have a part to play in the combat against the enemies of infant life. They ask to help; and they *can* help. Their part is to lay the foundation of that knowledge which it is advisable that all young mothers should have on the subject of Infant Care —knowledge which those among the more fortunate classes are able to obtain from skilled attendants and from books.

In teaching the general subjects of the school curriculum it is practically a question of instructing ignorance. But in this subject of Infant Care there is being given, concurrently with the teaching in the school, other teaching outside.

In the first place, the girls see their mothers (for whose opinions, happily, they usually have the greatest respect) treating their baby brothers and sisters in a way which is perhaps diametrically opposed to the treatment inculcated in the school. It is, therefore, of the greatest importance that the teachers should know what this treatment is, what are the customs and prejudices which have to be so tactfully counteracted, and what are the home conditions which oppose what often appear to be insuperable difficulties in the path of the mother.

On the other hand, there are, as is well known, many other agencies at work. Women Sanitary Inspectors, Health Visitors, Hospital Almoners, and the workers at Babies' Welcomes and Schools for Mothers, are all giving instruction to the mother about her baby. The tendency

is, more and more, to ensure that these workers should have real practical and theoretical knowledge of the subject, and not depend solely upon superficial information culled from pamphlets and leaflets.

It will readily be seen that, if complications are to be avoided, the teachers who lay the foundation in the first place should also have sound practical and theoretical knowledge, and not be in the position of amateurs.

How fatal to all permanent good, if a child were to retail to her mother statements made by the teacher which contradicted information given by others; and, on the other hand, what an additional power for good the teacher would have, if her teaching coincided with, and therefore gave weight to, that given by other skilled workers!

I am convinced that this is what the teachers themselves desire. From all sides one hears of the demand for fuller knowledge.

In this text-book I have endeavoured to deal with fundamentals in a practical manner, and always with an eye to home conditions, and in the hope that those who read it may be given an incentive to further study. For it is obvious that in this, as in other subjects, the teacher's personal knowledge ought to be far in advance of the instruction which it is necessary to give the children; and it must not be thought that all the information given here is to be necessarily passed on to the children.

Possible visits and questions from the mothers have also to be allowed for, when ignorance of certain facts might cause much difficulty and put the teacher into an invidious position.

I am only too well aware that book-knowledge alone is not sufficient, and I hope that the time is not far distant when the teachers will express such a demand for experience in the handling and general management of infants, that

arrangements will be made in all Training Colleges to meet the demand.

It will, I think, be found advisable to let lessons on Infant Care follow those on Home Management. I have made no attempt to lay down any scheme of teaching. In my opinion it is better for each teacher to work this out for herself. But she may find it well to use, concurrently, a Reader such as my booklet—*Caring for Baby**—upon which she will be able to enlarge according to the special needs of her scholars.

Much of her teaching will, alas! be obliterated in the years between school and marriage; but I am sure that, if the subject is well taught by teachers who feel its importance, much will remain to influence the girls in later life.

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INFANT CARE & MANAGEMENT.

CHAPTER I.

INFANT MORTALITY.

It is now a matter of common knowledge that, although the sanitary improvements of the last forty or fifty years have largely reduced the death-rate for all ages, yet the reduction in the infant death-rate has not been nearly so great; what reduction there has been dates principally from the beginning of the twentieth century.

We have a purer water supply and better drainage, better housing, cheaper and better food, and better clothing; in fact, a far higher standard of comfort and health prevails all round. Epidemics of the most serious of the zymotic diseases are less frequent and less virulent. Even the deaths from pulmonary tuberculosis have been greatly reduced. Medical and surgical knowledge has advanced in a marked degree. Why, then, has not the infant benefited more largely by these improvements?

Many theories have been advanced in answer to the question; but now it is generally agreed that the want of reduction in the infantile death-rate is due, speaking broadly, to the increase of town life and all that it involves.

In order to grasp the magnitude and the rapidity of this increase, let us bear in mind that in the year 1801 there were only five great towns in England and Wales with a population of over 50,000 and eight smaller towns with a population of between 20,000 and 50,000; whereas there

are now 96 of these great towns and 146 of the smaller ones. The rapid growth has been due, as we know, to the introduction of machinery into the processes of manufacture, necessitating the use of great quantities of coal and resulting in large centres of industry springing up around the coal-fields. It is not necessary to enter now into a history of these vast changes; our aim is to consider their effect upon the infant death-rate, that is, the proportion of deaths of infants under one year of age to every thousand births.

In dealing with statistics we find that to generalize broadly on any given figures usually results in wrong conclusions being drawn; and, although in such a book as this, intricate statistics would be out of place, yet it is absolutely necessary for all those who intend to take part intelligently in the great work of helping to reduce the high death-rate among infants, that they should start with clear thought as to its *cause*.

And so it is necessary to point out that a mere statement to the effect that infants die in much larger numbers in the town that in the country may be actually inaccurate. Hampstead and Mayfair, for example, are parts of London; Edgbaston is part of Birmingham, Crumpsall is part of Manchester, and Headingley is part of Leeds. But in all these urban districts the infantile death-rate is low. Take, however, the districts of the same great towns which are occupied by the artisan classes; and there we find the death-rate high.

We must not, however, run into another error and arrive at the general conclusion that the infant death-rate is low among the better classes and high among the poor—although there is a large amount of truth in such a statement—for we also find that among the very poor in *rural* districts it is low. The child of the poorest agricultural labourer runs a better chance of survival than the child of

a highly paid mechanic dwelling in a city; and some of the poorest countries, *e.g.*, Ireland, have a low infant death-rate. But poverty *in addition* to town life is a very serious factor, and plays a very large part in the annual holocaust of infants.

Let us, then, consider some of the conditions of town life which militate against the life of the infant and against the health, both mental and physical, of the *mother*; for the two must never be considered apart.

Late hours, excitement, restlessness, hurry, and noise are prevalent in town life. There is, as all know whose work has lain in great industrial centres, an utter want of peace and rest, and a fast disappearing home life. The employment of married women away from home accentuates the discomfort, and results in the artificial feeding of infants, either partially or completely.

We find that the food of the family is, to a great extent, artificially prepared or cooked away from home. A close proximity to drug stores and the grocer renders it only too easy to purchase patent medicines and patent foods. The large number of licensed premises and a debased public opinion make it easy for a mother of a certain social grade to drink, even in the morning, without lowering her social status, but to the neglect of the infant and the injury of the mother's health and character—both of which re-act again upon the child.

Neither can we leave the father out of consideration; for, although Nature has laid upon the mother a far heavier weight of responsibility than upon the father, yet we know that in very many cases that burden is increased tenfold by his wholly irresponsible conduct. Pleasures of all sorts, particularly drink and gambling, are easily obtainable and result in a reckless expenditure of the family income, often leaving very little for the necessaries of life.

In addition to these harmful social conditions, into the evil effects of which we shall enter more fully in subsequent chapters, there is the want of sunshine and fresh air, which is so detrimental to young life. There is, too, the dirt which is an ever present danger to the infant and trial to the poor overworked mother. One's wonder always is, not that many working-class homes are so dirty, but that the great majority of them are so remarkably clean.

The evils of overcrowding must assuredly be included as one of the factors which help to raise the death-rate; although, it should be noted, overcrowding is not limited to urban districts, but is to be found in the country as well. But, wherever found, the infant suffers, not alone on account of the vitiated atmosphere to which it is exposed, but also because of the increased difficulties which meet the mother when she attempts to attain to any reasonable standard of cleanliness and decency, and the extra strain which this puts upon her nerves, already under tension from the bustle of city life.

Neither can we omit consideration of the effects of vice upon infant mortality, when we see what havoc it plays with the lives of infants. But the subject opens up issues which are somewhat beyond the scope of this book. Those who have had some years of experience should undoubtedly understand more than they do of this subject, ignorance of which, in older teachers, is inexcusable. They could not do better than read Sir George Newman's most valuable book, *Infant Mortality*, obtainable at almost any Free Library, and purchase for their own use Dr. Hellier's Manual on *Infancy and Infant Rearing*.

By laying such special emphasis on the evils of town life and the consequent grievous results upon the infant population, it must not be thought that the conditions of rural life leave nothing to be desired. Wastage of infant life is to be

found in the country as well as in the town, although the destruction does not take place in so wholesale a manner. Parental ignorance is not confined to the inhabitants of cities; and ignorance is, after all, one of the most serious of the enemies that we have to combat—ignorance which is the result of a want of leisure and means to take advantage of the increased knowledge which is at the disposal of the more prosperous classes.

What, then, are the principal causes of death among infants? Teachers will get a thorough insight into the statistical side of the question in Sir George Newman's book already mentioned—quite the most comprehensive and lucid work of its kind. For our present purpose suffice it to say that, of the 114,000 or so of infants that die every year under one year of age, in England and Wales, the large majority die during the first three months of life; and, of the weeks in these months, the first is the most fatal.

Of the causes of death the principal are:—

I. *Immaturity*, including premature birth, congenital malformation, atrophy, and debility.

II. *Diseases of Respiration* (pneumonia and bronchitis).

III. *Diseases of Digestion*, including the diarrhœal diseases.

The deaths from these three groups have largely increased during the last fifty years in rural as well as urban districts—although in a higher proportion in the towns. To generalize broadly, the diseases in the first group are due to *ante-natal conditions*, those in the second to *exposure*, and those in the third to *artificial feeding*. With all these matters we shall deal in subsequent chapters.

But we must not omit reference to the serious fact that the same conditions which increase the death-rate tend also to increase the sickness-rate. In addition to the number of infants who succumb to the dire effects of their sur-

roundings, there is a still larger number who, although they survive, have their health permanently impaired. These swell the ranks of the unfit, the unemployable, and the vicious, and are a perpetual menace to the State.

Every teacher has experienced the difficulty which the presence of the delicate, deformed, or semi-intelligent child occasions in a class—even as every social worker knows the almost insuperable difficulties which are met with in dealing with a family of degenerates, where the father and mother are unfit, and the children diseased or feeble-minded. The inevitable end of such families is the workhouse, which means great expense to the State and loss to the community in every way.

How to prevent this wholesale waste of life and energy —how so to deal with the infant and with his environment that he may grow up healthy in mind and body—is the supremely important question before us.

CHAPTER II.

PREVENTIBLE CAUSES OF INFANT DEATHS.

In order to understand the preventible causes which are at work to bring about so large a number of deaths during the early weeks of life, we must not forget that the general health of both parents affects the health of the child, as well as the health of the mother during those nine months when the well-being of the unborn child is so intimately bound up with her own.

Among the conditions in either parent which may affect the child injuriously are tuberculosis (even though the disease may not be actually transmissible) and alcoholism, the children of drunkards being seriously affected mentally, morally, and physically.

In addition to these conditions is that of general ill-health or weakness and lowered vitality on the part of the mother. Here the results of town life show themselves early.

Special enquiries which have been made, show that in a large number of homes, even though the child may get a good mid-day meal so long as she attends school, yet, when she starts work, she contents herself with some such light refreshment as pastry and tea. It is at this time that anæmia and indigestion so frequently appear, being the result, not only of poor food and close workrooms, but also of neglected personal hygiene, particularly a neglect of constipation. Late hours, excitement, too little sleep, carelessness as to wet feet, and poor, even though, maybe, smart clothing all do their part. Hard work alone does not appear to be, necessarily, an injurious factor, but hard work in harassed circumstances, coupled with poor food, undoubtedly is.

Other conditions might be mentioned, but enough has been said to show that a girl frequently marries with poor health—even if she escapes disease.

During the nine months of pregnancy the healthy development of the child is largely dependent upon the well-being of the mother. It obtains its nourishment and its oxygen direct from her blood. If she is diseased, the developing child may become diseased too—may even die.

The study of the diseases of unborn children (ante-natal pathology) is comparatively in its infancy and does not now particularly concern us, except in connection with the general precautions which have to be taken, and the special dangers which have to be avoided at this time by the prospective mother.

It is pathetic how limited is the knowledge of many women on the matter. One would, for example, have

thought that all would have known the danger of such actions as stretching up to a high shelf, hanging clothes on the line, or lifting heavy weights, but this knowledge is by no means general. Neither does the fact seem generally known that special precautions need to be taken at the times when menstruation would have occurred in the ordinary course of events, and also at the end of the third and seventh months of pregnancy.

All the unhygenic conditions which, we have seen, affect the health of the young girl—poor food, constipation, excitement, and want of sufficient sleep—affect also the health of the unborn child. It is, indeed, vastly difficult for the poorer working-class mother to take the necessary precautions. How can she think of her own food when she sees her other children in want? How can she afford to pay for help with the family washing? These questions open up most serious economic difficulties, but an increased knowledge as to the seriousness of their import in view of the high infant death-rate and the lowered birth-rate cannot but do good.

And, after all, it is within the power of most mothers to control such very seriously unhealthy conditions as constipation, late hours, undue excitement, and the wholly unnecessary use of alcohol—in the power of most mothers and *most fathers*, for they, too, have an enormous responsibility and can help largely, if they will.

Here the work of the teacher is obvious. Want of self-control, want of discipline, is doubtless at the root of much of the evil; and without it we cannot hope for great improvement. The evils resulting from this want are to be found in all classes; but the results are far the most serious among those classes in which the margin of income is so small that want of self-denial may mean discomfort instead of comfort, disease instead of health.

The power of character over adverse circumstances is stupendous and can, happily, be seen every day in thousands of British homes. But the fact remains that there are also other homes where self-control in the parents is unknown ; and in such homes the condition of the children, morally and physically, is indeed pitiable.

But to pass on to the post-natal period—it has been said that we are never nearer death than at birth. Apart from the dangers through which the infant passes in the process of being born, there is also the time of *transition* after birth when the organism has to learn to adapt itself to its new environment. No longer does its nourishment reach it in a form which can at once be assimilated, but the digestive organs have to start work on their own account. No longer are the waste products carried away in the blood of the mother, but the excretory organs also have to learn their work ; no longer is the necessary oxygen supplied direct to the infant's blood, but the lungs have to expand and work for themselves. All these changes of function necessitate changes in the circulatory system. Certain blood-vessels, no longer necessary, atrophy, while others develop more fully. Even the heart undergoes a marked change ; for the opening which existed between the two auricles and allowed of the admixture of venous and arterial blood, closes at birth.

Neither must we omit reference to the skin, which has to accustom itself to a marked change of temperature ; nor to the handling and general disturbance to which the child has to submit, after the long period of undisturbed intra-uterine existence. This period is a critical one even to the healthy infant ; what must it be, then, to those who are weakly or diseased ?

A large proportion of the children who die during the first week of life die out of sheer weakness, out of simple

inability to adapt themselves to their changed environment. Such children show low vitality from birth, even though they may be born at "full-time." It is usually said of such a child that "it never cried properly." These lives can rarely be saved, certainly not with the rough-and-ready attention which is all that they frequently receive.

With children who are born prematurely, yet without disease, it may be otherwise. Some adverse circumstance, such as fright or a fall, may terminate an otherwise healthy pregnancy. A child so born is seriously handicapped and needs very careful attention if it is to survive; but a large number are born prematurely and die, whose lives undoubtedly *might* have been saved if greater care had been exercised. Such children need not necessarily grow up delicate, but may be of great value to the State; Sir Isaac Newton, Napoleon Bonaparte, and the Duke of Wellington were (it may be mentioned) all born prematurely.

These infants die largely from cold. Their vitality is very low, and the skin is unable to adapt itself to the changes of temperature. They should not be bathed, but the body should be rubbed all over with warm oil and wrapped in cotton wool—each limb separately, with an extra piece of wool for a napkin—and then rolled in a blanket and kept near a fire. Some of these babies are too weak to suck, and in such cases the mother's milk should be drawn off and given to the child.

Instead of this thoughtful care being given to them, we find that large numbers of these poor little mortals receive a daily bath, which necessitates exposure of the body and much handling. They are fully dressed and are even taken out of doors—frequently at night—to be seen by the doctor, lest death should supervene before medical help could be obtained, thus entailing the publicity of an inquest. Being unable to suck, artificial food is at once given, often in large

quantities. What wonder that so many of them die? Not only are they handicapped by being thrust before they are mature into an uncongenial environment, but matters are still further aggravated by the ignorance and laziness of those whose duty it is to tend them.

But of the fatal premature births a large number of the children are born diseased.

Among the many causes of early death are heart-disease and atelectasis, or want of expansion of the lungs; in such cases no amount of care could preserve life. Most people have heard of a "blue baby"—the child's face, and particularly the lips, remain blue, even after respiration is established. Here, the opening between the two auricles, which should close at birth, remains open. Death may occur within a few hours or days, or it may happen that life is prolonged into childhood. It is rare that children so affected attain adult life, and they are always extremely delicate.

Of deformities there is no need to speak—except to say that every case should receive medical and, if necessary, surgical attention.

One word as to the superstitions current regarding the cause of deformities and "monsters." One is often told a circumstantial tale of shock, from which the mother dates the deformity of the child. If the shock were experienced *after* three months of pregnancy, it could have had nothing to do with the condition, as by that time the child (or fœtus) is anatomically complete, with head, face, body, and limbs intact. So far, the causes of these abnormalities are unknown.

We will not consider further the adverse ante-natal conditions which handicap so many infants from birth. Of even greater importance to the teacher is a knowledge of the dangers which beset the ordinary child all through

infancy. To understand these properly, we need to know the physical peculiarities of the infant—the differences between the anatomy and physiology of infancy and those of later life.

CHAPTER III.

SOME INFANT CHARACTERISTICS.

A large number of those who are responsible for the well-being of the baby, look upon him or her as simply a miniature man or woman, who only needs increased growth and strength and a certain amount of obvious development—such as that of the teeth—to become a man or a woman.

But this by no means represents all the truth; and in this chapter we will consider some of the infant's main peculiarities, both of structure and of function, and their bearing upon our treatment of him.

Only those who have had anything to do with the handling and management of babies know the difficulties involved and the large amount of patience which it is necessary to exercise, if they are to be treated with uniform kindness. As an aid to this patience, it is well to remind ourselves frequently of their *helplessness*; we know it, but we do not always realize it.

Few animals are born so markedly feeble as the human infant, and few take so long to mature as man. Into the significance of this prolonged helplessness it is impossible to enter here. To those teachers who have been through a course of Kindergarten training, the subject should already be familiar. To them the fact of the infant's weakness and witlessness suggests the necessity of education; and indeed, the educability of man is that which sets him apart from all other animals.

The consideration of the social effect of prolonged infancy is outside the scope of this manual. What we have to consider is rather the fact itself than its racial import.

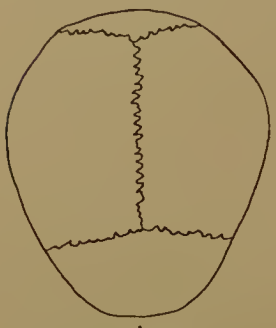
We find, then, that an infant is unable at birth to raise itself or even turn over, unable to feed itself or express its wants, unable to distinguish objects or sounds. Should danger come in its way, it cannot avoid it; should it be treated cruelly, it cannot retaliate. In brief, it is dependent wholly upon the intelligence and goodwill of those around it. The pathos of infantile helplessness is accentuated, when we see so many thousands of infants at the mercy of those who show gross ignorance and apparent heartlessness in their dealings with them.

Having dealt thus cursorily with this marked characteristic of helplessness, we will now pass to the consideration of the peculiarities of the infants's skull and brain. Our study of elementary anatomy will have taught us that the bones of which the skull of the *adult* is composed, are immovably united by saw-like edges which fit into each other. These irregular lines of union are called sutures. But the skull of a *newly-born infant* is markedly different. The saw-like edges are free—so free that, during birth, owing to the extreme pressure to which they are frequently subjected, they may even overlap, in this way preventing the skull from being crushed and thereby saving the life of the child.

But not only are the sutures ununited, but there are, between the corners of certain bones, large gaps where there is no bone at all. These spaces are called fontanelles. The one which is familiar to all is situated at the top of the head and somewhere to the front; and is known from its position, as the anterior fontanelle.

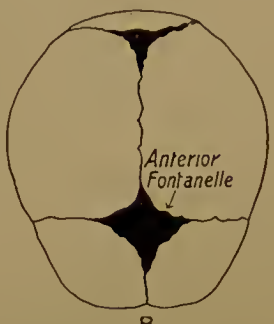
The soft substance which is felt beneath the skin is the brain, covered only by membrane. In process of time this

space will be filled up by the growth of the bone; artificial attempts at closure will not only be useless, but also cannot fail to do harm.



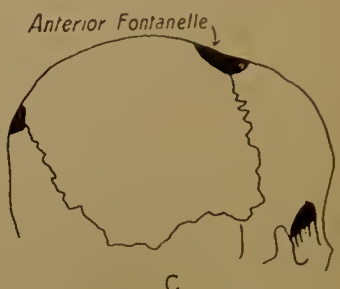
A

Adult skull as seen from above.



B

Infant's skull as seen from above.



C

Infant's skull, side view.

It would seem almost incredible, were it not a matter of such common knowledge, that ignorant persons should take great pains to close up the opening by pressure. With many old-fashioned monthly nurses and midwives such pressure is part of the daily ritual of the bath! Only those who have seen large rough hands pressing the soft little head know how horrible it is. The mother, naturally, takes her cue from the nurse and follows up the custom.

Convulsions during the early days of life are due to several causes. They may, for instance, be the result of the formation of a clot on the brain, caused by the pressure of forceps or by a particulary stormy passage into the world. What wonder, then, if this rash interference with nature after birth should also have its injurious effects? The probability is that more early cases of convulsions are due to this custom than has hitherto been realized. Such customs die hard; but, with the better training of midwives and with greater knowledge among mothers, it is to be hoped that it will gradually die out.

The infant's head must always be treated with the greatest care. The fontanelle ought to be quite closed at

eighteen months or two years. If it is still open then, or if it is wide open even at one year, it is a marked sign of rickets. It is always an unhealthy sign if it is depressed.

In order to appreciate the importance of the inculcation of good habits in infancy, it is necessary to point out certain facts connected with the condition of the infant's brain and with its growth. At birth the relative weight of the brain to that of the rest of the body is at least six times greater than that of the adult. The most rapid period of growth is up to the age of seven years, when it becomes less; and at twenty-five years it may be considered as complete.

The brain, as is well known, is composed of two kinds of material—*grey matter*, which is the outer substance, and *white matter*, which is the inner. The grey matter consists of cells; and at birth the full number of these is complete, although they are capable of growth and development. The white matter is composed of nerve-fibres which are prolongations of the cells. Each cell contains a central nucleus, surrounded by a substance called cytoplasm. It is provided with numerous branches, the numbers of which are *incomplete* at birth. These prolongations of the cells are of two kinds—the *dendrons*, which are short and do not pass beyond the grey matter, and the *neurons*, of which each cell has one, and this, passing into the white matter, there joins with other neurons and forms a nerve.

Now, the organization of the functions of the brain depends upon the development of these outgrowths from the cells. Although the number of the cells themselves is complete—even though some may be immature—yet the number and length of the prolongations and their numerous connections with each other, as also their formation, are incomplete. Of particular import is the rapid growth of the small fibres—the dendrons—and the increase of the connections between them.

To us the practical bearing of these facts lies in the knowledge, *that wherever there is instability and rapid growth, impressions are easily made, and impressions so made tend to become permanent.*

Even though at birth it may be already decided whether, for example, a child is to become a genius or a person of very ordinary capacity, yet, for good or for evil, much is left dependent upon training and education. Innate capacity, whether weak or strong, may be modified. Innate tendencies, whether good or bad, may also be modified; and the complicated effect of external influences is indicated by the multiplicity of connections between the elongations of the nerve-cells of the brain.

It is as if main roads were cut, or partially cut, at birth, but the side roads and lanes, together with the completion of the main roads, still remained to be constructed. The formation of habits, the development of character, the training of eye and ear and hand, may be likened to the opening up of pathways; these are not made all at once, repeated impressions are needed, but, when once made, the unmaking of them is a very difficult matter. Education therefore commences in a marked degree in the cradle, and will be referred to many times throughout this book.

The functions of the brain are manifold. It is, as we know, the bodily organ directly associated with consciousness and all mental operations, and it is essential to the performance of all voluntary action.

The various centres, tracts, or areas of the brain are severally devoted to the various operations of consciousness. The grey matter of the brain is the store-house of nervous energy. The cell-bodies of which it is composed receive impulses by the afferent or in-coming nerves from the external sense-organs; and thus sensations arise. The

efferent or out-going nerve-fibres convey impulses to the various muscles, and voluntary activity results.

At birth, the centres of the brain which are most fully developed are those associated with self-preservation. The child can taste, suck, and breathe; and the organs which have to do with digestion and excretion are also working. At first the infant appears to be deaf, but very soon it shows sensitiveness to sudden sounds.

Sight, as we know, is an extremely complicated sense, and takes long in developing; as a matter of fact, the centre of vision in the retina (the "yellow spot") is only developed after birth. The co-ordination of many muscles is also required—all necessitating inter-communication between the nerve-fibres of the cells in various centres.

Soon after birth the child is attracted by a bright light, then by the eclipse of light by a figure; gradually, after many impulses have found their way to the visual centre, distinct impressions are made and the child is then able to distinguish those around it. This is usually accomplished by about the sixth month.

We cannot carry the enquiry into brain development further, but these brief references will serve as illustrations. For a lucid outline of the development of the nervous system in the infant and child, the student could not do better than refer to *School Hygiene and the Laws of Health*, by Charles Porter. Those who care to study the subject more deeply, will find all they need in *The Growth of the Brain*, by Henry Donaldson, and *Education of the Central Nervous System*, by P. P. Halleck.

CHAPTER IV.

SOME INFANT CHARACTERISTICS (*continued*).

Among the many peculiarities of infantile anatomy and physiology, one which has a bearing on the health of the child is the unfinished condition of the *middle ear*.

The general anatomy of the ear will be familiar to all, as also the position of the Eustachian tube, which passes from the cavity of the middle ear to the throat. In adult life this cavity is completely isolated from the brain by bone. In the infant the bone is not completely ossified, but a small opening persists for some time in the upper part of the cavity. The Eustachian tube also is comparatively shorter and straighter in infancy than in later life. We see, therefore, that inflammation in the throat, which may be the result of cold, finds easier access to the middle ear in infancy and early childhood; and, moreover, when once there, the existence of the small opening renders the risk very great of its spreading further to the delicate membranes of the brain, and so causing meningitis.

It is, of course, ignorance alone which accounts for the gross neglect of running ears in infants. The mothers do not know that the pus which they see has only been able to find vent by breaking through the delicate drum of the ear, the tympanum. The recuperating power of Nature is wonderful; but the fact remains that neglect of inflammation of the middle ear frequently results in death.

Another significant feature is the position of the *bronchial tubes*.

In the adult the trachea divides into two parts opposite the fourth dorsal vertebra. In the infant the division is found to be situated *higher up*, opposite the third dorsal

vertebra. This points to the necessity of exercising greater care in the protection of the infant from cold, and may account for the ease with which bronchitis is contracted.

The *liver* of the infant is immensely large in proportion, compared with that of an adult. Whereas in the latter it is only about a thirty-sixth part of the weight of the whole body, in the former it is barely an eighteenth. An infant easily contracts a chill on the liver; and, for that reason alone, its body should be carefully wrapped up. Great precautions also need to be taken, during the early weeks of life, not to bathe it in chilly water, and not to expose the body unduly. A large number of the mild cases of infantile jaundice, when the face turns a yellow colour, are due to chill. If, as well as the face, the eyeballs also are yellow, and the urine stains the napkins yellow, then the condition is serious and the child needs medical attention at once. In the milder cases a dose of castor oil usually sets matters right, if attention is also paid to warmth.

The *bladder* of the infant is situated almost entirely in the abdomen, whereas that of the adult is lower down, in the pelvis. In the infant, therefore, it is without the protection of the pelvic ring, the ring of bone formed by the pelvic bones. Also, it is not covered with peritoneum; but the anterior wall of the bladder lies against the anterior abdominal wall. Here, again, is a condition which calls for special protection from cold.

Very important also is the difference in the *bones*. We are all aware that the bones of an infant are softer than those of an older person. We know that this is due to the fact of there being more cartilage (gristle) in the young than in the older bone, and less of the hard mineral matter which is the main constituent in the bones of adults.

Cartilage can be bent, whereas true bone cannot be bent; and this constitutes the prime difference between the bones

of an infant and those of an adult—*the former can be easily bent.*

We know the marked difference that there is between old wood and young wood. If an attempt is made to bend old wood, it snaps in two ; but a young twig can be easily bent. If a further attempt is made to *break* it, it does not snap clean in two like old wood, but partly bends and partly breaks. So it is with bone. Old bone *breaks* easily, young bone *bends* easily ; and when it does break, it is spoken of by doctors as a " green-stick " fracture, as it partly bends and partly breaks.

This will be clearly impressed upon the children, if the teacher demonstrates the fact to them with the assistance of a dry old stick and a green twig.

If the environment of the infant is good, ossification takes place, at first rapidly, later more slowly. This softness of the bones makes it of paramount importance that no undue pressure should be put upon them until the muscles are able to give them adequate support. It is, therefore, most unwise to *teach* a baby to walk. Let it teach itself, which it will do when in health, so soon as the muscles are fully developed. We shall deal with disease later ; here let it suffice to remark that the legs of even a healthy child may become bent, if it is made to walk too soon.

Here, again, demonstration will give considerable assistance to the teacher. If she obtains a fairly long piece of young wood from a tree and leans upon it as upon a walking-stick, the children will be able to see how easily it bends. It will be best to point out to them that when the pressure is taken off, the stick regains its original shape, but that, if it were *growing* upon a *living* tree and the pressure were kept up, then it would grow crooked.

The ends of the long bones (called the epiphyses) are strikingly different in infancy from what they are in adult

life. At birth they consist almost entirely of cartilage, and can be separated from the bone without much difficulty. Such an accident is not an uncommon one and may occur if, for example, the child is jerked up suddenly by the hand.

And not only are the bones of an infant different in consistency from those of an adult, but some of them are also different in other ways.

Let us consider, for a moment, a striking example. In the adult, a large mass of bone, called the sacrum, is attached by a joint to the lowest of the lumbar vertebræ. In infancy, however, it consists of five separate bones, united by cartilage. The apex, or lower and smaller end of the sacrum, bears a small bone called the coccyx, which in infancy consists of four separate bones.

From the fact that these bones are still ununited in the infant, it will be readily understood that, if the weight of the child is allowed to rest upon them (as in the sitting attitude), before the muscles are strong enough to hold the bones in place, there is danger of deformity occurring, particularly in weakly children. The pressure exerted will tend to bend the sacrum outwards and the coccyx inwards, which deformity may have very serious consequences in adult life.

As with walking, so with sitting—when the muscles are sufficiently developed, the child will sit up by itself; and, until it is able to do this, it is a great mistake to prop it up with pillows. A baby will give no trouble whatever, if left

to lie and kick either in its cradle or on a rug—provided that it has been accustomed to do so from the early weeks of life. It is another example of the value of inculcating good habits in infancy.

The formation of such habits depends, not only upon the *knowledge*, but upon the *character*, of the mother. If the mother's temper is uncertain—if, for example, she leaves the baby to lie one day and takes it up immediately it cries on the following day—it is unreasonable to look for good results. Many mothers and nurses treat babies according to the special mood they themselves may be in at the time. The mood may be one of excessive devotion, leading them to snatch the baby up from the cradle the moment it cries and to cover it with caresses; whilst, on some other occasion—in just the same circumstances, so far as the baby is concerned—they will leave it to cry without a word of comfort, or will even shake it and call it "naughty" for doing, let us note, what had previously resulted in caresses! Good habits can be taught in the cradle only by uniformity of treatment; otherwise impressions will not be made upon the growing brain.

But it is, indeed, not to be wondered at that the poor, overworked, overstrained mother should feel at times as if the baby were altogether too much for her. The demands made by an infant are great, even upon one whose only duty it is to look after it. How much greater must this demand be upon one with such numerous duties and worries as a working-class mother! It has also to be remembered that the mother has, in all probability, never had put before her the necessity of infant education; and she does not in the least realize the impossibility of forming good habits by haphazard methods.

Much will be accomplished, if it is impressed upon the children very clearly and very frequently that, when they

are looking after the baby, they must not let their treatment of him depend upon their own moods and tempers; for, if they do, the result will be what is known as a "spoilt" child, that is, one who has never been taught self-control.

If only the word "naughty" could be altogether dropped in our dealings with babies and kept for its rightful use with older children, it would be a step in the right direction. If the poor baby cries when hungry, tired, wet, hot, cold, thirsty, or in pain, or for any other reason, he is called "naughty." If he breaks a toy which, likely enough, was wholly unsuitable for him, he is "naughty." If, when able to walk, he gives way to his natural instinct of investigation and breaks something which ought to have been out of his way, he is "naughty." If the food runs down his face on to his clothes, because someone feeds him carelessly, he is still "naughty." Worst of all, he is so often called "naughty" for doing at one time what he has been allowed to do on previous occasions. When a baby cries, it is the duty of the one in charge of him to find out *why*. There will generally be found to be some reason.

In impressing points of this nature upon the children care should be taken, of course, not to reflect upon the actions of the *mother*. If illustrations of wrong treatment are necessary, it is best to speak of "some people" rather than "some mothers." It will inevitably follow that comparisons will be made between school and home methods; but it will be generally possible to avoid hurting the susceptibilities of the mothers, and their opposition to the teaching would be seriously detrimental to its usefulness.

The differences between infants and adults which have already been mentioned, might be multiplied many times over. In fact, in the words of Nathan Oppenheim in his book, *The Development of the Child* :—

"A complete account of the slow changes which make the child so widely different from the adult would include almost every item of physical and mental growth."

So extraordinary, indeed, is the difference, that if, for example, the blood of an adult were to be found to have the same consistency as that of a child, it would be considered diseased; the breathing, too, is different, as also is the pulse-rate. Other infantile characteristics, *e.g.*, teething and digestion, will be dealt with in a separate chapter.

CHAPTER V.

SLEEP.

As we have seen, the nervous system of the infant is very unstable; it is therefore not to be wondered at that it should be excitable and easily exhausted, and that nervous diseases in infancy and early childhood should be common. If the infant is to develop an unimpaired nervous system, it is of the utmost importance that he should be shielded as much as possible from undue excitement and noise, and should, above all, have long hours of undisturbed sleep.

Of all the conditions of town life which militate against health, the shortness of the period devoted to sleep is one of the most serious. Among all classes in large towns late hours are common; and among the working classes the evil is aggravated by the fact that, in spite of the late hours of retiring (frequently midnight), it is necessary to rise at about five o'clock in the morning, in order to be at work by six. Much of the longing for a stimulant, whether it takes the form of alcohol or strong tea, is due to overstrain of the nervous system which a more ordered life and plenty of sleep would go far to remedy.

All town dwellers are familiar with the sight of children playing in the streets at all hours ; and infants may be seen sitting on doorsteps, or carried in the arms of other children, or of their mothers, quite late in the evening. Frequently these babies are crying ; just as often they have fallen asleep, only to be awakened when it shall suit the convenience of the mothers to put them to bed. No infant can thrive with such treatment. It is absolutely essential for his development that he should have many hours of undisturbed sleep *in bed.*

The difficulties of working-class mothers are, indeed, very great, and no praise is too high for those who sacrifice themselves. These late hours are largely a matter of custom, and nothing calls for so large an exercise of "strength of mind" as running counter to the ordinary customs of those about us.

The young mother has been used all her life to go to bed late, and in all probability is suffering already from the effects of this bad habit, although she may not know it ; for it is impossible for her, with her limited knowledge, to associate many of the physical and mental ills which she sees around her with the want of sufficient sleep. She sees her relatives and neighbours keeping their babies out of bed late ; and it requires very strong influence indeed from outside to persuade her that the custom is harmful.

How to educate public opinion in this particular is a difficult matter. Many charitable and philanthropic people most certainly do not give sufficient thought to the evil. It is easy enough to denounce the custom, but often the very ones who denounce are those who encourage it, albeit, of course, unintentionally. They arrange late evening meetings for mothers ; school entertainments are also given in the evening. In both cases babies are brought ; but little

thought is given to them, as the sight of babies at late entertainments is so common.

The more privileged classes would not for a moment dream of allowing their infants to forgo the necessary amount of sleep; and until some such feeling is created among working-class parents, those who are trying to remedy the evil will be speaking largely into the air. But we have to remember that the privileged classes can arrange such matters without self-denial on their part. Keeping the baby in at night does not mean that they themselves will have to stay in—as is the case with working-class mothers. But these latter are capable of any amount of self-sacrifice, if once they are convinced that it is necessary for the well-being of the child. Teachers can doubtless do much by endless reiteration and example.

The baby should be in bed by half-past six in the evening; and, after the first two or three weeks of life, he may sleep all through the night (with perhaps one break for a meal) until six or seven in the morning, except for being taken up at ten o'clock to be fed, and to have his napkin changed. This sleep should be in a well-ventilated, dark, quiet room. It is, however, an almost universal custom to lay the baby down in the cradle or on the sofa in the kitchen, which is being occupied by the rest of the family. With what result? Even if the child sleeps, he will be breathing a hot and vitiated atmosphere, and there will be a light in the room and conversation—none of which conditions are conducive to the quiet, wholesome sleep which is essential.

But it has to be remembered that a bedroom in a working-class home is a very different place from the comfortable nurseries which are to be found in the homes of the well-to-do. Even during the most bitterly cold weather it may frequently be impossible to have a fire, owing to want

of means; in fact it is mainly on account of the cold that the child is kept in the cradle in the kitchen during the evening and then taken up *into the mother's own bed* later on. The cradles which are seen in cottage homes are mostly used during the day only. But in the many one-roomed houses in the large towns there is no option as to a sleeping-room; and the one-roomed home can never be a really healthy home for an infant. But it *is* possible, with thought and care, to manage better when there is even one bedroom.

The value of regular habits is very plainly to be seen in the matter of sleep. With patience, alterations can be made in sleeping arrangements even with a child some months old; it is done in hospitals, although it means trouble at first. It is much simpler to start from the beginning to put the child to sleep in its cot in a dark room; and there will not then be any trouble on that account. But in cold weather he will not keep warm without some artificial heat; and, if he is cold, he will not sleep.

Those who can afford it do well to go to the expense of an india-rubber hot-water bottle, but this is a luxury which is quite beyond the means of many people. A brick, heated in the oven, does well; but one cannot emphasize too strongly the necessity of wrapping it up in a clean old shawl, or piece of blanket, or flannel, so that it does not touch the child's feet. It seems, indeed, such an obvious thing to do that it hardly needs mentioning, but many and many a baby has been burnt by hot-water bottles which have been put too close to it by those who ought to have known better. The child should also be put into bed warm, with warm feet and hands. If these precautions are taken, he will go to sleep much more easily.

When putting a baby to sleep, care should be taken to see that the mouth is shut, as a child may sleep with the

mouth open from habit. The mouth should be closed and the head be slightly bent; for, if it is extended, the mouth will open again. No attempt must be made, however, to close the mouth when the child has a cold.

If the baby *cannot* breathe with its mouth shut, then it will be open by day as well as by night; and the child should be taken to a doctor, as it is a sign that there is some obstruction which prevents nose-breathing.

The inculcation of nose-breathing is essential. Not only does the nose act as a filter and a warming apparatus for the air, but by mouth-breathing the growth of adenoids is actually encouraged.

The cradle itself need not be expensive. Every one knows how one may be improvised out of a banana crate, or an orange box cut down, or a "pilgrim" basket (Japanese basket), or even a drawer. If any one of these is used, it should be raised a little from the floor on account of the draught. Care must be taken not to continue using any sort of cradle for which the child has become too big. He must be able to stretch his legs to their full length, or they will be retarded in their growth—or even grow crooked. *It is during sleep that growth takes place.*

An inexpensive mattress can be made with unbleached calico filled with either chaff or bran. The latter is perhaps the better of the two, as, when wet, it forms into lumps and these lumps can be easily removed. It is well to have two cases, so that, if one is wet, it can be washed out before it is dried and used again. But, if care is taken, the mattress need rarely, if ever, get wet. Mackintosh sheeting is expensive; thin white American cloth is not. If this is laid smoothly over the whole of the mattress and turned well under each side, it serves admirably to keep the mattress dry. Care must be taken not to crack it, as, when cracked, it is no longer waterproof.

It will be well always to remind the children that the shiny side must be upwards and the rough side laid on the bed, as the shiny side can be washed when necessary. The importance of laying stress upon a little matter of this sort is emphasized by the fact that so-called educated people have been seen wearing mackintosh aprons with the cloth side outwards.

The waterproof material must be covered with a blanket, or a shawl, or some other warm woollen material. No sheets are necessary or advisable, but the baby will need one or more blankets over him, according to the weather. In some of the poorest homes it is quite a common thing to see a heavy coat or skirt covering the baby in the cradle. Sometimes such covering is all that can be obtained; but it is not at all healthy, as it is heavy and therefore exhausting to the child, and, also, rarely clean.

During the day, when the cradle will be in the living-room, less covering is needed. But it is strange how little commonsense appears to be exercised even in so simple a matter as this; for one so frequently sees the baby in a cradle close by a hot fire and smothered with clothes. Over-heated rooms are extremely bad for infants, and the sudden change of temperature from the hot living-room to the cold bedroom is most injurious. Draughts are also bad; and the cradle should, therefore, not be placed either between the window and the fire or between the door and the fire.

The condition of the cradle is often simply shocking in the homes of the very thoughtless. It is allowed to get wet repeatedly, the child may even vomit into it, milk may be spilt in it, and it is left day after day in this most offensive condition, with dirty old clothing as covering. Needless to say, this is most unhealthy for the child. A great step will be gained, if the children are led to feel disgust

and shame at such a condition, and to want the cradles in their homes to be scrupulously clean and sweet.

The bedding should be thoroughly aired every day in the open air, if the weather be fine, and before the fire, if wet. A small pillow only is needed for the head, and the cover will need frequent changing. It is well to have a thin cotton coverlet over the blankets in order to keep them clean.

When the baby is about six months old, a piece of string netting put over the cradle very loosely and fastened down at either side will be found of great value. It should not be so tight as to prevent the child *sitting* up, but too tight to allow of his *standing* up. If this custom of putting a net over the cradle is commenced at an age before the child has begun to try to climb out, he will look upon it as part of his ordinary environment and will make no trouble about it. Only those who have used such a contrivance know what a great comfort it is to be able to leave the baby without fear of his falling out.

When she goes to bed herself, the wise mother puts the cradle on one or two chairs by her own bed, so that, if the baby wakes in the night, she will not need to get up in order to attend to him. If only, while their infants were still quite young, all mothers would put them to sleep in cradles at night, they would be saved many bad nights and frequent suckling.

The baby needs to sleep in the day as well as by night. During the first weeks of life he will sleep most of the time, except when being bathed or fed. The hours during the day when the child is laid down and put to sleep, should be as rigidly adhered to as the hour for going to bed at night. Habits of sleep are formed very quickly; and an immensity of trouble will be saved, if the mother is methodical.

In the early months of life the child should go to sleep in the morning after he has been fed, when the bath is over;

and this will enable the mother to go about her household work in comfort. Even up to the time he is two years old, or more, he will need an hour and a half of sleep in the morning and some afternoon sleep as well. Nothing should be allowed to interfere with these periods of sleep. It is well, however, to keep the baby awake for an hour or two before bedtime in order to ensure good sleep then.

CHAPTER VI.

CLOTHING.

Right teaching about infants' clothing is of the utmost importance. That the children take a keen interest in the subject is obvious; and, if they are taught to make the clothes themselves, there is very little fear but that what they learn will be remembered in later life. The teacher should understand the principles which underlie the choice of hygienic infant clothing. Simple patterns and inexpensive materials should be used, and all mere "fads" as to clothing be avoided.

The use of clothing is, primarily, to keep *in* warmth, to prevent too much loss of heat from the body by radiation. The surface of the body is comparatively greater in infancy than in adult life; and the larger the surface, the greater the loss of heat by radiation.

The infant's vitality is also lower; and, as it takes little or no exercise, the blood does not circulate so freely. These are reasons enough for the fact that an infant *does* feel the cold badly; and moreover, when it is allowed to get chilled, it undoubtedly suffers. A baby that is not warmly clad, that is not kept warm, is rarely a well-nourished baby; for a large proportion of the food it takes is used up to supplement the diminished heat, and there-

fore is not available for growth and development. A badly clad baby requires *more* food than a well-clad one, although, unfortunately, one finds that a child that is poorly clad is usually poorly fed as well.

If the blood is driven by cold from the feet and arms, or from any other part of the bodily surface, it must go *somewhere*. It is driven into the internal organs and may cause congestion, say of the liver. But if a baby is reasonably clad and properly fed, the extremities should not be cold ; if they are, it is a sign of weak circulation and a doctor should be consulted.

The important points about infant clothing are that it should be light, warm, and loose, and that the body and the extremities should be properly covered. The clothing should also be adapted to the temperature, and the garment next to the skin should be absorbent.

It is hardly any wonder that so many babies die from the effect of cold, when we know what a large number are inadequately clad. It is a very common thing to find a baby wearing nothing but cotton clothing from head to foot. Knowing, as we do, that cotton is a good conductor of heat, we realize at once that the amount of heat lost from the body by radiation in these circumstances must be very great. If, in addition to this scanty clothing, the child is inadequately fed as well, its chance of survival is small.

With one article of clothing which is found on so many babies, we can dispense altogether. That is the cotton shirt, pretty and dainty no doubt when edged with lace, but of no possible use, and harmful if worn next to the skin, on account of its chilling effect.

The first essential garment is a flannel binder or woollen belt. The binder should consist of a torn strip of flannel. It should be about six inches broad and thirty inches long. The edges must be left " raw " and not hemmed or bound.

It must not be made of flannelette or any other cotton material, as this is not warm enough.

Even better than a flannel binder is a knitted woollen belt. It fits closely to the child's body, without being unduly tight; and it is also easier to put on than the binder, which calls for some skill. A good method of making a woollen belt is to be found described on *page* 110.

Pink vest wool washes and wears better than white. There is no reason why any woollen garment should ever shrink. People usually make the mistake of washing woollens in water which is too hot, and drying them in front of too hot a fire.

The next garment is the woollen vest. This should have a high neck and long sleeves. A baby's neck and arms should never be uncovered, particularly in a working-class home, where the child is so frequently exposed to extremes of temperature.

The large size of the lungs is so often forgotten. They extend to just above the collar-bone on each side and right round under the arms, as well as in front of the chest and across the back. Bearing in mind this fact, as well as the fact of the higher bifurcation of the trachea in infancy (to which reference has already been made), we can realize the importance of protecting the neck, chest, and arms, apart from the general principle of the inadvisability of exposing any large surface of the skin to cold.

Many people recommend that the vests should be made in the shape of a jacket, opening down the front and folded over. This is said to do away with the discomfort to the baby of pulling a tight vest over its head. But the vest never should, and never need, be tight; and certainly it should not be put on over the head, but upwards from the feet. The jacket-shaped vest is apt to stretch open in front, leaving the baby's chest uncovered. It is also less simple

to make and takes more wool. A simple method of making a vest will be found described on *page* 110. It must be knitted loosely. A knitted ribbed vest is warmer and a better absorbent of moisture than one made of flannel. The children could not be taught any work more useful than how to make these vests quickly and well.

The next garment is a barrow. It is of great importance that this should be made of flannel, and *not flannelette*, not only because flannel is so much warmer, but because flannelette is so highly inflammable. It should be hardly necessary to warn teachers of such a well-known fact, as it should be a matter of common knowledge that numbers of children lose their lives every year owing to their flannelette garments catching fire.

If all flannelettes called "non-flam" were really less inflammable than others, we could recommend them for choice; but, unfortunately, some of those which are said to be "safe" are, in reality, quite as dangerous as the ordinary kinds. Also, some of those which may be quite safe when new, are as dangerous as ever when they have been washed several times. The *careful* mother can attain safety by putting alum in the last rinsing water, when washing the garments; one large tablespoonful to a quart of water is the right proportion. But, apart from the extra expense involved in the purchase of alum (it is fourpence a pound), we have to remember that it is just the careless mothers, those usually indisposed to take this extra trouble, whose children will probably run greater risks than will the children of careful mothers. And, further, flannelette treated in this way is very difficult to iron.

Dr. Perkin's "Non-flam" flannelette really *is* safe, even after it has been washed many times; it is dearer than the cheap flannelettes, being $6\frac{1}{2}d.$ or $7\frac{1}{2}d.$ a yard accord-according to width. After all, the cheapness is the attrac-

tion in flannelettes; but if the mother buys the flannel and makes the garments herself, she will be able to produce those made of warm and safe material at a cost very little more than the price that she would have had to pay for ready-made garments of poor material.

There are those who say that mothers will not now trouble to make clothes themselves, as they can buy them so cheaply ready-made. But, as is found at so many Schools for Mothers and Babies' Welcomes, they *will* make them when they are encouraged to do so, and when they realize that cheap garments are not cheap in the long run, as they are badly made and of poor material. If they have been taught from childhood to make them easily and well, they will be more likely to make the extra effort when they are grown up.

Children should have impressed upon them very clearly both the inflammable nature of flannelette, and also the impossibility of keeping a baby warm if clad in such material, as it is made of cotton only. They should also be given opportunities of making comparison between cheap ready-made garments and those which they are taught to make themselves; and they should know the difference in price.

Ready-made barrows are always of a bad shape. The cheap ones are far too skimpy for warmth; and they are all made with shoulder straps of tape, which leave the neck quite bare. The best shape is that given in the illustration (*page* 41). It is easy to make, being cut in one piece, in the form of a petticoat. It has a *high neck* with a runner, and *sleeves* instead of shoulder straps of tape. A tape is run in at the bottom hem, which is drawn up to keep the feet warm. This is better than the old-fashioned method of pinning up the bottom of the barrow. It is important that room should always be left for the child to stretch its legs and kick.

There are, alas! very many people who still think it necessary to wind a hard cotton binder round and round the child over the barrow. They say that they do it to support its back. This it most certainly does not do; for, if it were to be put on tight enough to make a support for the back, the child would be unable to breathe. Moreover, an infant's back should not need support, as it should be kept lying down.

The cotton binder is not only useless, but exceedingly harmful. It causes pressure over the very parts where special care should be taken to have no pressure.

Firstly, over the lungs: when this binder is on, the lungs cannot expand to their full capacity and therefore cannot develop properly.

Secondly, over the stomach: it is generally put on over an empty or partially empty stomach. When food is taken, the stomach cannot distend as it should do; and it is frequently found that children wearing these binders cry after their meals in the daytime, but not at night and in the early morning, when the binder is off.

Thirdly, over the breasts: the breasts of a young infant are often very tender, and it is no uncommon occurrence for them to swell and even contain a little milk. This is quite natural, and, as long as they are treated carefully, further harm rarely results. If they are inflamed, they should be bathed gently with warm water, and a piece of cotton wool should be placed across them, so as to prevent pressure. The hard binder does great harm by pressing on the breasts and often causes inflammation, which sometimes even results in an abscess, giving great pain to the child.

There is a wide-spread custom, among ignorant nurses and midwives, of squeezing and pressing the breasts of infants. This often results in inflammation, followed by

an abscess. The women give various reasons for doing it; but, needless to say, it is a wholly useless as well as a cruel custom. It is not confined to any special part of the country, but appears to be practised everywhere.

If an infant is provided with a woollen belt, a long-sleeved woollen vest, a properly made *flannel* barrow, and a pair of woollen boots, its gown may be made of cotton. A *real* "non-flam" flannelette is good for winter wear, and nainsook or long-cloth for summer.

The illustration on *page* 41 shows a simple gown cut in one piece, with the addition of a round yoke. It is easy to make, and can be shortened by putting in tucks in the skirt, and enlarged by letting out the tucks on the shoulders. Both this and the barrow are good patterns to teach children to make in poor districts. But it is well to warn the children not to tie the band tightly, and to fasten it at the side or in front, rather than behind, as it is not comfortable for the baby to lie on the knot.

The provision of napkins is an important matter; but, even if the cheapest are bought in sufficient numbers, the expense is no light one for a slender purse to bear. Turkey towelling is a very much better material to use for them than either linen or ordinary calico, as it is warmer and absorbs moisture better. Unbleached calico, which is so frequently used, is much too hard. One sees napkins of this material put on sometimes, which are as stiff as boards. The misery caused to a baby can easily be imagined. A fairly-good cheap Turkey towelling can be bought for $4\frac{1}{2}d.$ a yard. At least one dozen of these will be required.

A far better material than Turkey towelling, and as cheap, although not so easy to be obtained, is swansdown calico. It is sold by the pound. That which measures 59 inches wide is the best. It costs 1*s.* 3*d.* per lb., containing about $2\frac{1}{4}$ yards. *Half* of this width folded into a V

shape makes a good-sized napkin. It is best for a mother to buy 2 lbs. of the material, as this will suffice for ten napkins and the price will work out at 3*d.* per napkin. It is very soft, absorbent, and washes and *boils* well. Those mothers who use it for their babies never wish to use anything else.

It is generally known that babies' napkins should never be washed in soda, as this causes chafing of the skin; nor should they be dried after they have been taken off wet and put on again without having been rinsed out first. If care is not taken in this particular, the baby's skin will become very sore.

In many cottage homes one finds that soiled napkins are thrown down in a corner of the living room or put in a bucket and kept there for some time, making the atmosphere most offensive. They should be put into cold water and rinsed out and washed as soon as possible. Care must always be taken that napkins are well aired before being put on.

Whenever it can be afforded, a flannel pilch should be worn over the napkin. This is for the sake of warmth, as it prevents heat from being lost from the body through the cotton napkin, particularly when it is wet. A good size for a pilch is 30 inches long by 25 inches wide. It should not be folded like a napkin and passed between the legs for a long-clothed baby; but about a third of its length should be folded over, and then the pilch should be wrapped round the body, over the napkin, and fastened with a safety pin.

The baby should never be allowed to lie in wet or soiled napkins, or it is sure to get sore. It *ought* to cry if the napkin is wet; but if it is frequently left lying with napkin unchanged, it may actually become used to the discomfort and not cry. The skin, however, will not get used to it; and there will, moreover, be much more difficulty in training

the child in good habits. No better habits can be taught a child than regularity in the action of the bowels. Want of care in this particular, accounts for more disease and general ill-health than most people realize.

Owing to the plastic condition of the infant's nervous system, the habit of regular evacuation of the bowels, at the same time every day, in response to an external stimulus, such as contact with a chamber utensil, is learnt wonderfully quickly—sometimes by the time it is three or four months old. If the mother, after noting the time that the little infant has usually had an action of the bowels, holds it out shortly before that time every day, the lesson of association between the contact with the utensil and the call for defæcation will soon be learnt; but this training needs patience at first. In the early weeks of life there are two to four motions daily, later one or two.

The child should also be held out before being put to bed, after the last feed at night, and always on waking, whether by day or night. If this is carefully attended to, much wetting of napkins will be saved.

A baby should not wear the same clothes at night as during the day. A young infant will need a vest, a woollen belt, and a flannel or "non-flam" flannelette nightdress. All through infancy and early childhood it is well for the child to sleep in a vest as well as a flannel nightdress, as most children throw their arms outside the clothes and are therefore liable to catch cold, if they are not properly protected.

For a long-clothes baby all that is necessary for outdoor clothing is a soft woollen bonnet and a woollen shawl. The latter is preferable to a pelisse, which is heavy and not nearly so warm. The hood should not have a starched frill, as this distresses the baby unnecessarily; and the strings should be soft.

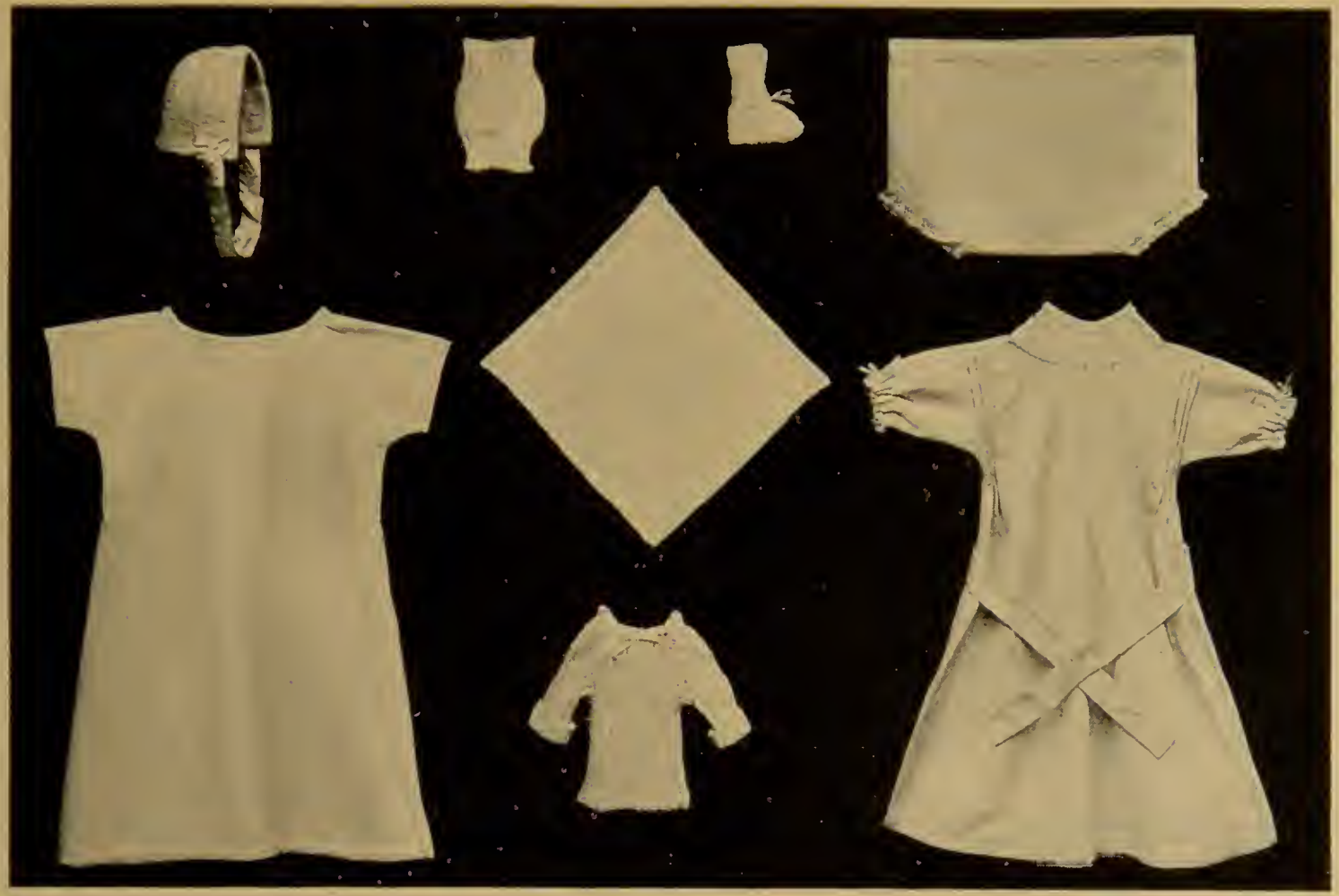
Short-coating can take place at about the age of ten weeks in summer, with strong babies. Should the baby be delicate, the change should be postponed, particularly if it is winter. The children should be specially warned against thinking that, when a baby is short-coated, it is time for it to sit up!

The short-coated clothes should never have the sleeves short, but reaching to the wrist; and they should also be high-necked. These are matters of more importance among the poorer classes than among those who can afford many changes of clothes to suit the seasons.

If the vest and belt have been carefully washed, they will be useful for some time. The barrow and the gown can be shortened into petticoat and frock. If a mother prefers to keep the long clothes unaltered, then a simple flannel petticoat can be made with the bodice and skirt cut in one piece. Cotton stays should never be worn, as they are too hard. Simple stays can easily be made out of the strips of flannel which are left over after cutting out the flannel garments, or even from the selvedges which have been torn off.

When a baby is put into short clothes, the great mistake is so often made of leaving the body and lower limbs naked. All of us have seen the pitiful sight of babies sitting about on door-steps with their bare skin on the stones. This careless custom results in much disease and many deaths, although the mothers do not attribute the trouble to the real cause.

As long as it is necessary for a baby to wear napkins, they always *should* be worn. Careless, thoughtless people frequently take the napkin and pilch off when wet, and do not at once put on clean ones, but leave the child naked until it suits their convenience to put on others. When the napkins are no longer required, the child should wear little



Typical Articles of Clothing for a Young Infant.

flannel or knitted drawers. These are not a luxury, but a necessity for healthy life in our changeable climate. A pair can be made, cut in one piece, with three-quarters of a yard of flannel (*see illustration, page* 41). There is no reason why the flannel should be white, as this will prove extravagant wear when the baby begins to crawl. A striped shirting (mixture of cotton and wool) does well, and for older babies, who have a way of getting themselves dirty remarkably quickly, blue serge or other cloth material can be made into little loose knickers, into which the petticoats can be tucked. Some mothers have an excellent plan of putting a patch of American cloth into the seat of the knickers, so that the child can sit about with less danger of chill.

The flannel drawers can either be buttoned on to the stays, or else have a tape or elastic run in. There is no reason why elastic should be tighter than tape (*neither* should be tight); it keeps the garment up better, but of course cannot be *washed*. Elastic will be found much more satisfactory to run in the knickers for the older children.

There is no need for babies to wear bonnets or hats after they are short-coated, provided care is taken to assure the change being made during warm weather. Those who wear none are much less liable to colds in the head.

Some sort of jacket or coat will be necessary, warm and woollen in the winter, and lighter in warmer weather. A pelisse is heavy and just as troublesome to put on as a coat, on account of the sleeves.

Long socks should be worn with the shorter clothes, and woollen boots over them. The feet of babies a few months old are not strong enough for hard boots or shoes.

All the patterns spoken of in this chapter are those used at the Leeds Babies' Welcomes, and can be obtained from the publishers of this book.*

* See advertisement at end of book.

CHAPTER VII.

FRESH AIR AND EXERCISE.

Of the requirements of infancy, fresh air is one of the most important. Simple though the requirement may seem, many babies are brought up with very little of it. Even in country homes, fresh air *in* the house is often looked upon as quite unnecessary. We are all familiar with the close, offensive smell which meets the nostrils on entering some homes. The offensiveness is largely due to old and dirty furniture, clothing, and bedding, to the unwashed bodies of the inmates, and frequently to unemptied slops.

No opening of windows will keep rooms sweet if the inmates and their surroundings are dirty. Cleanliness of the home and its contents is, therefore, of the first importance if the air is to be fresh. Both personal clothing and bed-clothing should, and could, be washed much oftener than they are; and too much stress cannot be laid upon the unhealthiness of keeping old clothes and rags about.

The rag hearth-rug is frequently an object to be carefully avoided, as, on account of its disgusting condition, it very often harbours vermin. The baby spends a large part of its time on or near the hearth-rug; and it is often fouled with excreta and all manner of other impurities. If bacteriologically examined, it would certainly be found to be swarming with micro-organisms.

The baby's bath will be dealt with in another chapter. If all the other members of the family were to have a warm bath or wash all over once a week, the atmosphere of cottage homes would be much more wholesome than it is at present. With careful management this can be done; but, consider-

ing the difficulties in most cottage homes, the *daily* bath advocated by many health lecturers is altogether impracticable, though, of course, some parts of the body should be washed daily.

In the country it is easier to keep clean than in the town, although in the country it is often difficult to obtain a sufficient supply of water; and what water is obtainable has generally to be fetched from outside, sometimes from a considerable distance. Perhaps our own standard of cleanliness would be somewhat lowered, if we ourselves had to bring in the necessary water from outside in all weathers, and heat it in a small kettle.

In the town slum, the fight with dirt is so constant that one wonders why more women do not give up the apparently hopeless contest. Whether the home is a tenement or one of a row of "back-to-back" houses, the fight is always going on. The back-to-back house, so common in the great industrial centres, is, on the whole, the more difficult to keep clean. These rows of houses, with their backs adjoining, are usually flush on the street. Dust from the road blows direct into the living-room, which opens on the street; and dirt is brought in on the feet of the inmates.

Another point to be borne in mind is that the artisan quarter of a city is always near large works, and so, in addition to the street dirt, there is a great deal of black smoke, the smuts from which pour in through the doors and windows.

In tenement houses the dust is not so serious an enemy, particularly in the higher dwellings; but the smoke is as bad or even worse. When, therefore, we light-heartedly impress upon the working-class mother the necessity of opening her windows and letting in the air, we need to remind ourselves that it means letting in a large amount of extra dirt as well.

We must also bear in mind that, when the street door opens direct into the living-room, that room is always liable to be draughty. It is noticeable that the street door is frequently left open, whereas the window seldom is. If attention were paid to cleanliness and the window were kept open a little at the top, except in very bitter weather, and the door kept shut, the air of the rooms could easily be kept fresh.

In the evening, when the family is gathered together, any draught from the window can be broken by drawing a curtain across the window.

The fact of the living-room being also the kitchen is an aid to ventilation; for, as the fire needs oxygen for its combustion, it is drawn in through the door or the window (even through cracks, if door and window are shut), and so the air of the room is made to circulate.

It is *stagnant*, *over-heated* air, laden with impurities from dirty surroundings, that is most injurious. A baby cannot thrive in such an atmosphere; fresh, clean air is essential to its health, and fresh air must be breathed by night as well as by day. We know that, in order to ensure adequate movement of the air, there must be both an inlet for fresh air and an outlet for foul air. Ordinarily this is accomplished by the provision of a window and a fireplace. But in cottage bedrooms there are often no fireplaces, and in such rooms the air is rarely fresh.

But the pity is that, when there *are* fireplaces, they are, as often as not, boarded up because it is said that they cause a draught. In garret rooms the wind does blow down the chimney very strongly sometimes; but the register should not be shut and the fireplace should never be entirely boarded up, as it is far too useful as a ventilator. A good plan is to make a number of good-sized holes in the board,

as then the chimney still acts as a ventilator, but the force of the wind is broken.

The temptation is very great to keep the bedroom window shut in winter. For those who have plenty of warm bed-clothes it is a simple matter to keep it open. But when, owing to want of sufficient covering and want of food, the cold is an enemy to be really dreaded, one cannot wonder at the windows being shut to keep it out. But even if the bedroom window is shut at night in very cold weather (or open a very little way), it ought to be thrown wide open first thing in the morning; and slops ought to be emptied as soon as possible. But, instead of this being done, the room is often left shut up all day, with unemptied slops and unmade and unaired beds. To add to the impurity of the atmosphere, some people burn a paraffin lamp at night; and, as this is left to burn itself out, the smell in these shut-up rooms is made still more objectionable.

But among a large number of people, it is not only during very cold weather that the bedroom window is kept shut, but all the year round, as a matter of habit. As the rooms are small and are usually occupied by several people, the result on health is very bad; and the baby is the first to suffer.

But even if the air of the house is kept reasonably sweet, the baby will not thrive unless it is taken out regularly into the open air. It is quite easy for this to be done in well-to-do homes where a nurse is employed for the sole purpose of looking after the baby; but it is by no means so simple a matter for the working-class mother.

In fine weather, and if it is not too cold, a strong baby can be taken out for an airing when it is a week old, provided care is taken to wrap it up very warmly and to keep it out for only a short time, at first, during the best part of the day. This may be considered as mid-day in winter,

up to three o'clock—and, in hot weather, before mid-day and between four and halfpast five.

If the family dinner has to be prepared, it is almost impossible for the mother to get her housework done and the dinner cooked and the baby taken out as well in the morning. But that is no reason why the child should be deprived of fresh air. In the country, where there may be a garden, it is a simple matter, on a fine day, to dress the child in its ourdoor clothes and lay it in the perambulator in a sheltered place. If there is no garden, and when the weather is wet, it can be dressed and laid in the perambulator at the open door and get an airing that way. If there is no baby-carriage, the sofa can be utilized and drawn up to the door.

It will be well to let the children think out little plans like this for themselves. and also to draw their attention to the danger of putting the perambulator out into the street, as some accident might happen whilst the mother was busy. Let them think of some accidents that might occur, such as the perambulators being pushed (accidentally or out of mischief) off the pavement into the road—or a dog might jump up and frighten the child.

It is a very real difficulty for a working-class mother to provide a *good* perambulator for the baby. In fact, unless the parents have married with some money in hand, a labourer's baby runs very little chance of having one, particularly if it has not been bought for the first child. A good perambulator must allow for the baby to lie down, until he is at least eighteen months old. Even a cheap carriage of this description cannot be bought for less than thirty-nine shillings and sixpence, and this will not be a really serviceable article.

A perambulator made of canvas can, it is true, be bought for eighteen shillings. This can be opened out so that the

baby can lie down. It can also be adjusted to enable the child to sit up, when he is older. It is not at all a warm carriage for the winter, but is infinitely preferable to a push-cart (or go-cart), in which the baby cannot lie down, but can only be huddled up with its back bent and its head falling over to one side when asleep, and in which it is impossible to support the child properly or to keep it warm.

A cheap form of carriage the right shape.

Push-carts are bought because they are both cheap and convenient. One can be bought for so small a sum as six shillings and elevenpence. It can fold up; and that is an advantage, as the mother can then take it with her on a tram-car when shopping. It is also very light.

The work of the teacher is clear. She must so impress upon the children the evils of taking a baby out in a push-cart until it is about two years old, that they will not easily forget the warning. She must also let them see that she is not unaware of the reasons why push-carts are so popular.

A practical demonstration will be necessary. In one school at least,* probably in others, an admirable object-lesson is arranged. Those girls who mind babies are asked to bring to the school the "prams" in which they take them out; and, when possible, one baby is brought as well. (It is best to make sure that the chosen baby is a good-

Unsuitable in every way for an infant.

Cheap, but only fairly good.

tempered one!) The teacher demonstrates the evils of the push-cart and the good features of the perambulator, in which the child can be laid down.

There are many little matters, relating to baby's outing, about which the children will need to be warned. To begin with, baby should always start out with a clean napkin on. If the outing is to last any length of time, as in summer, a clean one should be taken to change. The girls must be shown how to lay the rug or shawl in the perambulator first, with a piece of American cloth under it. The rug can then be wrapped warmly round the feet and body of the child, after it has been laid in. In cold weather, and until the baby is at least eighteen months old, it will be necessary

* Green Lane Girls' School, Leeds.

to put either a hot-water bottle or a hot brick at the foot of the carriage. Precautions as to protecting the feet from being burnt should be repeated in this lesson. And it should be noted, further, that a pillow is necessary for the head.

Even if the baby has begun to sit up a little it must always start for its outing lying down. If this is made the *rule*, there will usually be no difficulty. But difficulty will be met with, if an attempt is made to lay the child down in the middle of its ride, after it has tasted the joys of sitting up and looking about it. As the little back becomes very soon tired, baby will enjoy sitting up much more if it is given that pleasure for a short time on the homeward journey after, it is to be hoped, a comfortable sleep.

The careful teacher will think of many fairly obvious, but yet important, matters about which she can talk to the girls. She should warn them to keep on the shady side of the road in summer, and not to loiter about corners ; to be careful not to take their hands off the perambulator when on a slope, and not to indulge in that dangerous trick of giving the "pram" a push whilst going down hill, then leaving go. It may be fun for the girl, but it may also cost the baby its life, as the carriage may suddenly swerve to one side and go over, either from passing over a stone or a piece of uneven ground, before the girl in charge is able to catch it again.

Let the girls be told also that the perambulator should not be jolted off the pavement. Warning should, moreover, be given as to the care necessary in keeping the baby's arms out of the way, when putting the hood up or down. The springs are so strong that a little arm may easily be broken by them.

In summer, when the child is able to walk a little, it will be taken out of the perambulator and allowed to toddle

about for a little while in the park or the country fields and lanes. The danger of letting babies sit about or walk on damp grass should be strongly emphasized.

Children, and often older people as well, appear to be quite forgetful that the legs of a baby or a little child are not so strong as their own. It is a pitiably common sight to see a poor little toddler vainly trying to keep up with an older person, either lagging behind some distance or being dragged along by the arm. A baby should never be obliged to make an effort of this sort; it only causes over-fatigue, which is most detrimental to healthy growth. But the muscles do need exercise; and a baby should, from the earliest weeks of life, be allowed to kick and throw its arms about for a few minutes every day, when undressed in front of a warm fire.

CHAPTER VIII.

THE BATH.

Although it may not be possible in a cottage home to provide a daily bath for grown-up people, yet for the baby it is an absolute necessity. The mere fact of its body being so frequently soiled with excreta and urine makes careful bathing necessary, if soreness is to be prevented. In addition to this, we know that, if the sweat glands are choked, more work is laid upon the kidneys; and, as the organs of an infant are in an unstable condition, it is important that each should have only its own work to do.

The best time for baby's bath is the morning, as soon as possible after the family breakfast. The bath should never be given directly after the baby has had a meal, but it should be so arranged that the meal is due shortly after the bath. If the baby be bottle-fed, the milk can be mixed

beforehand, so that it will be necessary only to warm it up. It should not take more than a quarter of an hour to bath a baby ; but a good half hour must be allowed, to include preparations and tidying up afterwards.

The lesson on the bath needs great care. It is one of much importance and also of keen interest to the children.

It is difficult for a teacher who has had no experience in bathing babies to give a satisfactory lesson on the subject. It is a great mistake to get out of the difficulty by asking a mother to bring her baby and show the children how to bath it. If all mothers knew instinctively how to bath their babies the best way, there would be no need for lessons. The best way is the simplest way and therefore the easiest.

The whole process is here given in *detail ;* and if the teacher gets a good model doll,* and practises with the help of this book, she ought to be able to manage fairly well. She should decide before her lesson, on the best way to place the bath, chair, table, water-jug, etc.

The children should be allowed to practise until they can wash and dress the baby doll without difficulty. To see it done is one thing, to do it themselves quite another thing.

When using a model doll, emphasis should be laid on the points of difference between a doll and a baby. No doll has yet been made with a sufficiently flexible neck. A little baby's head always needs support. Neither has the doll a flexible back, which also needs support, nor lively legs and arms which make sudden movements when least expected. Greatest difference of all, the baby doll does not cry ; and a crying baby is apt to make an amateur nurse forget everything that she ought to do, in her anxiety to comfort the child.

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*The "A.L." "Model Baby" Doll, net 10/6, supplied by E. J. Arnold & Son, Ltd., Leeds, is the best.

It is necessary, first of all, to impress upon the children the importance of having everything ready before taking the baby out of the cradle, and the teacher should be very sure of herself before giving the lesson. The kettle will, of course, be on the fire and the water hot. The window should then be shut and a screen put between either the window and the fire-place or the door and the fire-place, whichever happens to be the more draughty place. If there is no screen, a clothes-horse with a table-cloth thrown over it will serve the purpose; even an arm-chair covered with a cloth is better than nothing.

The best sort of bath is an ordinary zinc tub; and, as one of this kind is to be found in most homes, it should be used for demonstration purposes in the school.

In some very poor homes even this convenient utensil is not to be found; and the baby is often bathed in the bread bowl, which serves many purposes. It does fairly well whilst the baby is quite small, but is a poor sort of "bath" when the child is older.

If the bath is small enough, it may be placed on a chair by the fire, if there is one in the home large enough and stable enough to hold it; otherwise it must be on the floor. It must never be put in the sink, as that is too cold a place in which to wash a baby.

The nurse's chair must be low, so that she can make a comfortable lap for the baby, and it should be placed so that, when the baby is on her lap, its feet are towards the fire. She should also face the light; owing to the position of the window, it is not always possible to do both. A fire-guard should always be before the fire. In cottage homes a high nursery fender is not often found, but at least a small guard can be hooked on to the bars.

The clothes which the baby is to wear should be laid out, in the order in which they will be wanted, on a chair

on the side of the fire opposite to that on which the child is sitting, and yet within reach of her hand.

The towels should be laid on the back of the chair which holds the bath. A soft one should, whenever possible, be kept for the baby's face only. *Two* Turkey towels will be found to simplify drying very much, one to be laid on the lap over the flannel apron or piece of clean old blanket, which must now be put on, and the nurse's sleeves be rolled above the elbow.

The following adjuncts of baby's toilet will be needed :

(1) *Soap.*—It is a mistake to use scented soaps, as they often contain impurities which are injurious to the child's skin. The best sort is curd soap or a good primrose soap. Both are cheap.

(2) *Powder.*—Fuller's Earth should not be used. It sometimes contains serious impurities and, as it is not white, it does not show when it is dirty. Nor is scented powder good. The best to use is a half-and-half mixture of boric acid powder and zinc powder. This is quite cheap.

Whatever powder is used, it should be kept in a box with a lid, which should be closed when not in use. A penny powder-puff will also be needed. *This must be kept in the powder-box.*

(3) *Grease.*—Pure lanoline is perhaps the best, but *fresh, unsalted* lard does well. Vaseline is not so good.

(4) A small *sponge*, or a piece of soft *Turkey towelling.*

(5) A piece of *flannel.*

(6) Some small pieces of *quite clean rag.*

(7) If a flannel binder is being worn, a pair of blunt-pointed *scissors* will be needed ; also a strong *needle* and a reel of 36 *cotton.*

(8) Some strong *safety pins* that will not bend easily.

All these things should be kept by themselves for the

sole use of the baby, in a little covered basket or a box with a lid.

Eveything being ready to hand and the table cleared, some cold water should be poured into the bath *first*. Emphasis should be laid on this at every lesson, as very many serious accidents have occurred from children falling into scalding water. The hot water can then be added from the kettle, until the temperature is about 100°F.; this is to allow of its cooling to blood heat (98·4°F.), whilst the baby is being undressed, etc. It is better to have it too hot at first and have a jug of cold water at hand to add to it when bathing begins.

A bath thermometer can be bought for sixpence, but, if sixpences are too scarce, the temperature should be judged by the elbow and not the hand, as the latter is too hardened by use to be sufficiently sensitive. The water should feel comfortably warm and neither hot nor chilly. The children will always be impressed and sympathize with the baby, if they are told of the little nursemaid who, when asked how she judged of the right warmth for the bath, said that, when the baby turned red, she could tell it was too hot and, when it turned blue, she knew it was too cold!

If the door opens into the street, it should now be locked in case a neighbour may walk in, whilst the baby is naked, and cause it to be chilled by the cold air.

DETAILED INSTRUCTIONS AS TO BATHING.

Take the baby from the cot and lay it on its face on the lap. Warn the children against letting the nose and mouth rest on the lap; the head should be a little way over the knee. Unfasten the nightdress and then roll the baby over on to its back, holding its arms to its sides whilst doing so, and turning the baby *towards* you as you do it, as this prevents the apron from being rolled up at the same time.

Careful attention to details of this sort will make bathing much easier.

The nightdress must now be drawn off *at the feet*, and one Turkey towel be laid over your lap and the other wrapped right round the child under the chin and over its vest and napkin.

Take one piece of rag (about two inches square), dip it into the water, drop a few drops into one eye, wipe *away* from the nose, and throw the rag into the fire. Use a fresh piece of rag for the other eye. Great care must be taken with the eyes; and, if there is the least inflammation, they should be carefully bathed, night and morning, with boracic lotion.

The eyes of young infants are liable to be exposed to the very great danger of infantile ophthalmia. Although the first symptoms of the disease may be only those of a cold, yet it develops so quickly that, in virulent cases, the eyes may be past cure in twenty-four hours, and the baby blind for life. It is, therefore, of the utmost importance that, *within the first fourteen days of birth*, the eyes should be examined by a doctor immediately they show the slightest redness or discharge. True *ophthalmia neonatorum* (*i.e.*, of the newly born) rarely develops *after* that time. There are many cases of blind babies whose eyes might have been saved, had it not been for neglecting to consult a doctor in time.

It is on account of baby's eyes, that it is so necessary for it to have a face towel all to itself, particularly if there are other children in the family, who might bring the infection of sore eyes from school.

Now take another piece of rag, twist it round one finger, dip it in the water, carefully and gently wipe round the inside of the mouth, and then burn the rag. This obviously cannot be done with a doll! But the children's attention

must be drawn to its necessity. Thrush is a very common infantile ailment; it is caused by the growth of a fungus in the mouth. It is a sign either of digestive trouble or of want of cleanliness, or both. When a baby has thrush, white patches are to be seen at the back and sides of the mouth and tongue. The mouth of a young infant should also be wiped out after each feed.

The face must now be gently washed, *without soap*, with the little sponge kept for that purpose alone. The eyes should not be touched again. Rags for the eyes can be given up, when the baby is about two months old; and then the sponge can be used for the whole face. After the face has been carefully dried with the soft towel, you must now stand up, and hold the child under your left arm, with the head over the bath and the towel still round the body, whilst you soap the head all over; then thoroughly rinse the soap off with the flannel.

No soap should be allowed to get on to the face, and it is very easy to prevent it. You can now sit down, and the baby can be laid on the lap again, and the head be carefully dried. As soon as the child can sit up alone, the head can be washed whilst it is in the bath; but until then it must be done separately. There should never be a patch of scurf on the head. If there is, soap and water and rubbing will not bring it off; but it will be necessary to rub in a little lanoline or lard over-night, and it should then come off when washed in the morning. If it has been allowed to get very bad, it may need several nightly applications of the grease before it comes off.

So far, all that has been done can be accomplished in two or three minutes.

The napkin is taken off next; and, if the child is soiled with excreta, these should be wiped off with a corner of the napkin before the body is washed. Next, take off the

binder or woollen belt. If stitches have to be cut, care must be taken to put the fingers between the binder and the skin.

Lastly, take off the vest, *not over the head*, but over the feet. The clothes, all but the napkin, should be put on the table when taken off, and not thrown on to the floor.

Now, quickly make a lather of soap on the flannel and wash the body, legs, and arms ; turn the child over (*towards* you) and soap the back, etc. Then turn and lift up the very slippery child, stand up, and put it in the bath. It is difficult to describe in words the right way to do this. It is important that the left arm should support the baby's back, and the left *hand* hold the left leg from underneath. If an effort is made, with the help of the doll, to understand this, it will be seen that the head can then be supported on the arm. The right arm can assist in lifting the baby into the bath, and be afterwards used to rinse off the soap thoroughly with the flannel.

Until the baby can sit up alone, it will have to be held with the left arm whilst in the bath, as there is always danger of its slipping down into the water ; to do this properly it is better to stand. It will not be necessary at this age, to keep it in longer than half a minute ; but, when it is older, it will enjoy kicking for a minute or two.

On taking it out of the bath, lay it on its face on the towel in your lap. Dry the back and the backs of the legs and arms gently, but thoroughly ; and lightly powder the creases at the back of the neck, behind the ears, and also between the buttocks. If this part is in the least sore, it should be slightly greased with lanoline or lard, instead of powdering ; but ordinarily, grease is not needed. The child will not get sore, if it keeps in good health, and if care be taken to wash and *dry* and powder lightly the parts after each motion, and the previously mentioned precautions are

also taken with the napkins. A rash on the buttocks is generally associated with thrush, and is the result of a form of stomach trouble.

Now turn the baby over on to its back, removing at the same time the wet towel from the lap. Dry the front of the body, legs, and arms, paying particular attention to the creases of the neck, the armpits, the groins, and between the fingers and toes. Lightly powder as before.

The vest can now be put on, from the feet upwards; and then, before completing the dressing, it will be well to hold the baby out, either over the bath, if the sponge and flannel have been taken out, or else over a small chamber utensil which is held on the lap. If the room be warm and the fire good, the baby may then be allowed to kick for a minute or two, but not long enough to get chilled.

Putting on a binder is not at all an easy matter. It may be put on firmly over the hip-bones, but must be quite loose over the abdomen, so as to allow of the insertion of several fingers underneath. As the proper manipulation of a binder is not simple, and as the girls are not likely to be allowed any home-practice, it might be well to accustom them to the use of a knitted woollen belt, which must be put on over the feet.

Now lay the child on its face; fold and place the napkin and pilch across the body, tucking them in tightly under the sides; hold them and the arms carefully, and turn the baby over. The napkin must not be put on too tightly, although it needs to be firm. When pinning it, the left hand must be put between it and the baby's skin to prevent the child being pricked. A bent pin should never be used, as it comes unfastened so easily.

If the long flannel is made in petticoat shape, it can be put inside the gown, the sleeves being slipped through those of the gown. Both garments can then be drawn on together

over the feet. In putting on sleeves, one hand must always guide the baby's hand and arm through the opening, as the thumb is very easily caught and may be injured.

The baby can now have its meal, and will then probably go to sleep.

The girls should be reminded that the room must then be tidied. Night clothes should be aired before they are folded up; and towels should be dried in front of the fire. The sponge and flannel must also be dried, if they are to be put back into the basket. If they are left lying about, they are sure to get dirty.

The bath must be emptied, washed out, and dried; and the window be opened. The soiled napkin must be either taken out of the room, or be washed out at once.

The object-lesson to the children will be a very practical one, if they both prepare the room for the bath and tidy it up afterwards.

CHAPTER IX.

INFANT FEEDING.

Of all the difficulties which are met with in endeavouring to reduce the infant death-rate, those associated with infant feeding are the worst.

The ignorance which exists upon the subject, among both rich and poor, is astonishing. In addition to this ignorance, there are, among the working classes, so many difficulties in connection with such matters as housing, food-supply, and means of subsistence, that it is cause for wonder that the mothers manage as well as they do, and that so many infants survive and even grow up healthy.

Even if the whole of this volume had been devoted to the consideration of the subject, the fringe alone would have been touched. But for those whose time is so largely

occupied with other subjects it is well to concentrate upon general principles and practical suggestions.

Attention has already been directed to many of the marked characteristics of infancy, which differentiate it from adult life. There are also differences between the digestive apparatus of an infant and that of an adult. Although these are many, two only will be particularly dealt with here.

In an adult, a very important part of the process of digestion takes place in the mouth. The teeth masticate the food; and the salivary glands not only secrete the fluid which moistens it, but this fluid contains a ferment which is of use in the digestion of starch. But a young infant has no teeth; and the diastatic ferment (ptyalin), which assists the digestion of starch, is so scanty as to be of little use until the end of the first year.

Starch is also digested by a ferment which is present in the secretion from the pancreas; but, as this is not found in the infant until the sixth month, its absence in the saliva as well is of some importance.

The muscles of the stomach and the intestines are weak in infancy; and the peristaltic contractions are, therefore, not so great as in an adult. Many other important details might be mentioned; but these points alone show that, in any case, solid foods and foods containing starch are unsuitable for infants.

Before proceeding further, it will be well to deal with the times of eruption of the teeth. In the majority of cases a healthy infant cuts its teeth with very little distress. There are, however, many who cut every tooth with an attack of diarrhœa or convulsions. It will usually be found that the digestion of the child is at fault, and that the eruption of the tooth puts the finishing touch to the trouble. Doubtless children who suffer from rickets not

only cut their teeth late, but also cut them with much greater difficulty than healthy children. Rickets is essentially a disease due to defective diet; and children suffering from it are peculiarly liable to convulsions. Some babies suffer from bronchitis when teething; but with proper care this ought not to happen.

Soothing syrups and powders should never, under any circumstances, be given to infants. The statement may appear futile in face of the huge quantities of these drugs which are sold. In no other European country is the unrestricted sale of secret remedies allowed as it is in England.

After the administration of drugs a screaming baby may become a quiet baby—for a time, the reason being that most of them contain sedatives of a most dangerous description. A large number contain opium in some form. Infants are specially susceptible to its action, and many have been killed by it. Laudanum and morphia are both forms of opium. Two drops of laudanum may be a fatal dose for an infant. Unfortunately anyone can buy laudanum; some mothers buy a pennyworth and make their own soothing syrups and cough mixtures.

Paregoric also contains opium and should never be given to infants or children.

Even though the child may not be killed by these drugs its health is impaired.

Needless to say, alcohol is also a dangerous drug for an infant. Under the Children's Act it is illegal to administer spirits to infants and children.

The first tooth should be cut at about the seventh month. It is usually a lower incisor, the two lower central incisors being cut first. These are usually followed by the two upper central incisors, and, about the age of nine months, by the two upper lateral incisors. Next month

follow the two lower lateral incisors; and the first four molars (two in each jaw) come by the end of the twelve-month. Twelve teeth should thus be through by the time the baby is twelve months old. If none are through by then (or even by nine months), it is a sign of rickets. The four eye teeth (or canines) are cut at about eighteen months, and the last four molars at from two to two and a half years. A baby has, therefore, twenty temporary or milk teeth.

The children will find it easy to remember this, if the teeth are compared with the fingers and toes—those in the upper jaw with the fingers, and those in the lower with the toes.

Whilst the teeth are being cut, special care should be taken with respect to diet and also to other matters of hygiene.

It is taken for granted that the students already possess some knowledge of food values; will know, for example, that, in order to maintain heat and energy, repair waste, and ensure healthy growth, food must contain adequate quantities of proteids, carbohydrates, fat, mineral salts, and water. But let them also remind themselves that, whereas the food of an adult is required principally for the purpose of providing energy, and only secondarily is building material necessary—and then only for the repair of waste—yet with an infant, as it should double its weight at birth by the time it is five months old, and treble it by about the end of the first year, it is of the utmost importance that the diet should meet the requirements of this rapid growth.

In the mother's milk Nature has provided an ideal food for the infant. It possesses all the essential constituents in their proper proportions, and is absolutely suited to the digestive capacity of the child.

These are the two important points: first, the food must contain the right materials for growth; and, secondly, it must be capable of digestion and absorption by the infant. Unfortunately, many people consider only the second point. They are content if the food does not produce digestive disturbances; but it is quite possible, and of only too frequent occurrence, for a food to agree with the child's digestion, although it is wholly inadequate for the purpose of healthy growth.

It is necessary, therefore, to know the constituents of mother's milk. It varies in different women; it varies also at different stages of suckling, being, for example, widely different a few days after birth from what it is about six months later. Its constituents are also different at the end of a meal from what they are at the commencement.

Average percentages alone can, therefore, be given.

The following may be considered as the average composition of human milk after about three months of suckling:—

Proteids, *i.e.*, nitrogenous substances in the form of casein and lactalbumin ..	1·5 to 2%
Fat (cream)	4%
Carbohydrate, in the form of milk-sugar	7%
Mineral Salts	0·2%
Water	87%

Of these the proteids are the most important, as they are the only possible body-building material; they alone can be utilized for growth and for the repair of waste due to the wear and tear of the tissues. But they may also be utilized for the production of heat and energy.

In human milk the proteids are present in an easily soluble form. The larger part of it consists of casein, which, when acted upon in the stomach by rennin, as the coagulating ferment of the gastric juice is called, forms a

curd. The rest is lactalbumin, which does not curd, but remains soluble and is easy of digestion. Even the *casein* of human milk does not form a dense curd, but is broken up into flocculent or flaky masses which are easily acted upon by the other digestive juices in the stomach.

After the proteids, fat is by far the most important constituent. Being highly combustible, its main use is to provide heat. But of most importance is the fact that, when fat is deficient in an infant's diet, *the nutritive power of the proteids is minimized*, although the reason for this is not as yet clearly ascertained. A deficiency of fat in the diet is the main cause of rickets, although the disease shows itself principally in defective bone and muscle formation. Rachitis (rickets) occurs in spite of the fact that the amount of proteids in the diet may be adequate, and fat is not used to form either bone or muscle—which, as we know, can be built up only by the use of proteids.

It should be carefully noted that fat in the food does not necessarily form fat in the body. Some of the fattest infants are those which are brought up on foods deficient in fat, but containing carbohydrates (starch and sugar) in excess.

The fat in human milk (cream) has a low melting point, which makes it easy of digestion. This digestibility is further increased by the fact that the droplets of fat are very finely divided.

The main use of carbohydrates is to provide energy for muscular work. Even an infant uses its muscles when kicking, crying, and throwing its arms about; and the muscles of the heart are always steadily working. The only carbohydrate present in human milk is lactose or milk-sugar. This form is most easily digested.

The mineral salts are essential, but it is not necessary to particularize concerning them. There are, in addition

to the constituents already mentioned, certain nitrogenous extractives which are found in human milk, though their exact composition is unknown.

Human milk is always alkaline in its reaction. The anti-scorbutic element, counteractive of scurvy, must not be omitted. It is not known what this is; but it is present in all *fresh* foods, though not in those which have been preserved, or boiled, or sterilized. People who are deprived of fresh food for any length of time are liable to contract scurvy.

In addition to these facts concerning mother's milk, it should be remarked that, with a healthy mother, the baby's natural sustenance is perfectly pure and clean and ready warmed.

Such, then, is the food which Nature has provided and which is found to be most suitable both for the digestion and nourishment of the infant. For it is an indisputable fact that the chances of survival are infinitely greater for the breast-fed than for the hand-fed baby. The aim of all, therefore, should be to teach, first of all, the hygiene of natural feeding; let it be taken for granted that, whenever possible, a mother should nurse her own baby.

But mistakes are made even with natural feeding; and these mistakes usually begin very early. Until the first day or two after birth, the milk only comes into the breasts in very small quantities. This is a natural arrangement. If the child were in need of food, the food would be there for it; but as it is not, the supply is very scanty and sometimes for a day or two there may be even none. This is not detrimental to the child; and the loss of weight within the first week of birth is of no consequence.

The baby should be put to the breast, as soon as the mother has had a good rest after its birth. This should be repeated every two hours during the day, but not oftener

than every four hours, at the most, during the night. The suction aids the secretion of milk and helps the mother in other ways as well.

In addition to this, until lactation is fully established, the baby will need a little warm water administered in a teaspoon occasionally.*

The importance of waiting for the natural flow and not supplementing it, unless absolutely necessary, is emphasized by the fact that the secretion from the breasts in the early days of the child's life is markedly different from that which is present later. It is more watery-looking and is known as colostrum. It has peculiar properties, which are said to act as a laxative ; and this makes the use of any other aperient, such as castor oil, unnecessary. Normally it should not be given, although many ignorant people look upon it as a routine necessity to administer a dose of castor-oil to a newly-born child. If there has not been an action of the bowels up to twenty-four hours after birth, then it is advisable to give half a teaspoonful of oil ; and, if this does not act, a doctor should see the child at once, as there may be some obstruction.

Colostrum is also eminently suitable for the delicate, untrained digestive capacity of an infant ; and at this early period any artificial interference with Nature cannot but do harm. It is a common custom to give a mixture of butter and sugar to an infant before the milk has come into the breasts, thus courting digestive trouble at the outset. If a baby is too weak to suck, the milk should be drawn off with a breast-pump and given by spoon. The weaker the child, the more dependent is it upon its mother's milk. As it gets stronger, its power of sucking will increase.

* Infants frequently suffer from thirst, particularly in hot weather, and should be given a teaspoonful or so of water occasionally between meals.

It is of the utmost importance that nothing should interfere with the regularity of meal-times. The greatest mistake that can be made is to feed the child "whenever it cries." A very large proportion of the babies that are taken to the out-patients' departments of hospitals, are taken because they are suffering from digestive disturbances caused by irregular feeding.

It is usually sufficient to give the baby one breast for a meal; and the meal should last for from ten to twenty minutes. The baby should not be allowed to fall asleep whilst sucking, but should be kept awake. On no account must it be put to the breast again until two hours have elapsed; and then it must be given the other breast.

By the time the child is six weeks old, the times between meals must be gradually increased until, by the time it is three months old, it is fed only every three hours, *by the clock*. If these times are rigidly adhered to, much digestive trouble will be prevented, the child will be better nourished, and the action of the bowels will be more regular. The stomach must have rest. The milk does not merely flow through it and the intestines, and become directly absorbed into the system. Two hours must elapse before it is even sufficiently digested to leave the stomach.

Let it be clearly impressed, then, upon the children that feeding a child very frequently will *not* ensure its being better nourished, but rather the contrary. When a baby cries, it is not always hungry. It often cries because of wind; and although being put to the breast again for a few minutes may console it for a time, yet the ultimate result is disastrous.

The most important part of an infant's education is regularity in feeding. During the day-time the child should always be waked up when feeding-time comes round; but at night it should be accustomed to sleep as long as possible.

By the time it is six months old, it ought not to need feeding between ten or eleven o'clock at night and six next morning.

When nursing her child, a mother must be careful with her own diet. She does not need to eat large quantities of food; but her meals should be taken *regularly*, and what she does eat should be nourishing and digestible. It should not be highly seasoned; nor should she drink acid drinks. Alcohol is wholly unnecessary, if not actually harmful. A glass of milk or cocoa, taken in the middle of the morning and last thing at night, will be of much greater benefit both to the mother and the child. Cocoa is infinitely more palatable when boiled; and, when made with half milk and half water, it is very nourishing. It is strange that in so many working-class homes alcohol is looked upon as a necessity, and milk as a luxury; whereas the opposite is the truth.

Oatmeal porridge, pea-soup, stews made from the cheap cuts of meat, stewed fruit, and vegetables are all excellent for nursing mothers. Tea should be taken only in moderation. Twice a day is quite often enough; and even then it should not be too strong and should be freshly made. A nursing mother should, for the sake of her child, be careful of her nerves. Nothing affects the milk so much as an unstable nervous system. Highly-strung, nervous women are rarely able to nurse their babies satisfactorily; and incessant tea-drinking makes nervous women sooner or later. It is a very serious matter for a woman to become dependent upon tea or any other stimulant; for then not only is her nervous system injured, but her power of self-control is weakened.

Any "nerve storm," such as an outburst of temper, may so seriously affect the milk as to make it disagree with the child seriously. There are other conditions which affect the health of the mother injuriously, and so affect

the supply of milk. Late hours, excitement, hurry, rush, constipation—all these should be avoided. It is a mother's absolute duty to take care of her own health at this time. For example, a mother's milk has been known to disagree with a child, but has been wonderfully improved by the simple expedient of taking a daily walk.

There are cases in which, whatever precautions are taken, the milk is either insufficient, or of a poor quality, or of such a quality as persistently to disagree with the child. Even in such cases the baby should not be weaned until a doctor has been consulted. Many people give up nursing for no sufficient reason. It should be persisted in, until it is apparent that the child is really likely to suffer if it is continued.

If a woman is tuberculous, she should not nurse her child; and in some cases her own health is otherwise so obviously unfit for the extra strain that the doctor has to forbid it.

Among working-class mothers breast feeding is the rule, as artificial feeding is so much more expensive. Weaning should take place gradually and be completed by the end of nine or ten months. Many mothers go on very much longer, to the injury of their own health as well as that of the child. It is by no means an unusual thing to come across cases of mothers who are actually suckling *two* children, the older baby as well as the new one!

Weaning should not take place during the hot summer months, as that is the most dangerous time of the year for infants on account of summer diarrhœa. This will be dealt with in another chapter.

CHAPTER X.

ARTIFICIAL FEEDING: COW'S MILK.

Difficulties crowd in thick and fast when, for any reason, a substitute has to be found for mother's milk. There is no truth in the assertion that it will not "mix" with cow's milk. Even if the mother has but little milk of her own, the child will be the better for it in addition to other food.

But, at the outset, let it be clearly borne in mind that Nature's ways are best, and no substitute can be so good as mother's milk; a real substitute would seem, indeed, to be impossible of production.

Improper feeding is responsible for a higher mortality among infants than is commonly recognized. It is the *primary* cause of many deaths which are registered as due to other causes; for weakness and ill-health, the result of defective nutrition, often render a child not only susceptible to disease, but also incapable of battling against it.

If, however, a baby is deprived of its natural nourishment, whether wholly or partially, it is obviously the part of sensible people to try and follow Nature as far as possible, and model the artificial substitute on her lines.

We have seen something of the constituency of human milk; let us now consider what thousands of babies are given instead—cow's milk in some form or other, fresh or preserved, merely diluted or mixed with some other food.

But cow's milk is markedly different from human milk; and the differences are not only *quantitative* but *qualitative*. That is to say, not only are there differences in the *relative amounts* of the various constituents, but the constituents themselves are different in *kind*.

The relative amounts in human milk have already been given.

Cow's milk has

more of Proteids,	3—4%	instead of	1·5—2%.
less of Sugar	4—5%	,,	7%.
about equal Fat	3—4%	compared with	4%.
Mineral Matters	0·7%	instead of	0·2%.
Water *equal*	87%	against	87%.

It can be seen at once that the amount of proteids can be lessened by dilution with water; but, when this is done, the milk becomes deficient in fat and sugar. These, therefore, must be *added*. It is strange that every one should recognize the necessity of adding sugar to cow's milk, and yet extra cream, which is of greater importance, should be so frequently omitted.

But these quantitative differences which can be remedied, are as nothing when compared with the far more serious qualitative differences. The *proteids* in cow's milk consist mostly of casein, with only a small quantity of the more easily digested albumen. The casein, moreover, is very different from that of human milk; for, instead of being precipitated in a fine curd readily acted upon by the gastric juice, the curd which is precipitated by the rennin is much denser and far more difficult of digestion.

The *cream* of cow's milk is also different from that of human milk. The fat globules are larger and also have a higher melting point; they are, therefore, less easy of digestion.

When we come to the *added sugar*, it is found that, in most cases, ordinary cane or beet sugar is used. This is very different from lactose (milk-sugar) and is answerable for a great deal of acidity and flatulence.

Attention was drawn to the importance of *nitrogenous extractives* in human milk, where they are found in the

proportion of one-eleventh of the whole proteid constituents. In cow's milk the amount is smaller, being only one-sixteenth of the proteids.

In cow's milk there is also to be found an indigestible residue called paranuclein. This is absent in human milk. Whereas the reaction of human milk is *alkaline*, that of cow's milk is *acid*. How, then, can the assertion for a moment be maintained that cow's milk, even at its best and purest, can be so adapted as to make it *like* human milk?

But, unequal though it is, a careful preparation of cow's milk is the best substitute which can be given if Nature fails. It is unwise to keep to the milk of one cow only, as any failure in the health of this one would affect the milk; mixed milk is better.

It is by no means an easy matter to adapt the milk to the needs of every infant.

The system known as "percentage feeding," of which Dr. Rotch of Boston was the originator, is the one which most exactly adapts the food of the infant to its peculiar requirements.

In the words of Dr. Ralph Vincent, who carries out the system at the Infants' Hospital, Westminster, "by this method which he devised, any desired milk mixture can be prescribed so as to contain the various constituents in any proportion required." But this necessitates the employment of milk laboratories, as the various constituents of the milk must first be divided up and the prescriptions afterwards made up from them.

It is most probable that the time is not far distant when such laboratories will be established in many of the great towns. The Bradford City Council have recently decided to establish one. Until scientifically adapted milk is more easily procurable for the cases in which artificial

feeding is a necessity, the generality of people must do the best they can in difficult circumstances.

In teaching the children it is well to impress upon them at the outset the small size of a baby's stomach. It will probably be found that most of them look upon the whole abdomen as the stomach, whereas this organ, at birth, will hold only an ounce of food. An excellent diagram is published by the St. Pancras School for Mothers,* showing the actual size of a baby's stomach at different ages, from birth to one year.

Overfeeding should always be avoided. A child may be overfed, either (1) by giving the food *too strong* (*i.e.*, with too much of any one constituent, particularly the proteids), or (2) by giving *too much* at a time, or (3) by feeding *too often*. But the error of giving *too little* food must, of course, be equally avoided.

The child may be half starved, either (1) by having the milk *too highly diluted*, and without any added cream, or (2) by being given *too little* at a time, or (3) by being left to go *without food for too long intervals*, either on account of carelessness in noting the time, or, more frequently, because it is allowed to sleep for too long during the day, under the mistaken impression that sleep is even better than food.

The child must always be fed regularly *by the clock*. The want of regularity has even more dire consequences with a hand-fed than with a breast-fed baby.

For the first six weeks, as in breast-feeding, every two hours must be the strict rule. At that age the intervals must be gradually increased, a few minutes at a time, until by the time the child is three months old, it may be fed every three hours.

The children can easily be taught to remember this; and, if every elementary school-girl is convinced of its

*1, Ampthill Square, Hampstead Road, London, N.W.

absolute importance, there will be a great improvement in the health of the coming generation.

The regularity of meal-times is a most important part of infant education. When the same intervals are strictly adhered to, the nerve-centres controlling the gastric machinery will learn to respond regularly, the bowels will also act more readily, and the child is being given its first great chance in life to grow up healthy.

In order to avoid the other dangers in connection with overfeeding, or underfeeding, it is necessary for every one who has charge of a baby to use some simple food-chart. The children need not, of course, be required to memorize the chart; but they should be taught its use, and how to read it. No food-table will suit every child; some children require less, some more. The table given below must, therefore, be looked upon only as one which will suit an *average* child.

FEEDING CHART FOR AN AVERAGE CHILD.

Age	Interval	Number of Feeds in 24 hours	Number of Night Feeds	Amount at each Feed	Total Amount in 24 hours
1 week	2 hours	10	1	1 ounce	10 ounces
2 weeks	2 ,,	10	1	1½ ounces	15 ,,
4 ,,	2 ,,	9	1	2½ ,,	22½ ,,
6 ,,	2½ ,,	8	1	3 ,,	24 ,,
8 ,,	2½ ,,	8	1	3¼ ,,	26 ,,
3 months	3 ,,	6	0	4¾ ,,	28½ ,,
4 ,,	3 ,,	6	0	5 ,,	30 ,,
5 ,,	3 ,,	6	0	5½ ,,	33 ,,
6 ,,	3 ,,	6	0	5¾ ,,	34½ ,,
7 ,,	3 ,,	6	0	6¼ ,,	37½ ,,
8 ,,	3 ,,	6	0	7 ,,	42 ,,
9 ,,	3 ,,	6	0	7 ,,	42 ,,
10 ,,	3 ,,	5	0	8½ ,,	42½ ,,

It will be well to make the children perfectly familiar with the fact that two tablespoons represent one ounce

and twenty ounces make one pint. But they should also be given to understand that a spoon is not a strictly accurate means of measurement.

It is best to add the water, the cream, and the sugar to the milk as soon as it is taken into the house, morning and afternoon.

This preparation is of great importance. For instance, during the early days of life, the infant's stomach, which was not made to digest cow's milk, will find much difficulty in dealing with the dense curd. The milk must, therefore, be given at first in a highly diluted form. The increase in strength (as in quantity) must be very gradual, so that the digestive organs may be able to adapt themselves to the change. Intelligence is a prime necessity in dealing with the food of an infant; "rule-of-thumb" is of no use.

At first there should be 1 part of milk to 2 parts of water; at the end of 3 or 4 weeks, equal parts of milk and water; at the end of 3 or 4 months, 2 parts of milk, 1 part of water. By 6 months there may be $2\frac{3}{4}$ of milk, $\frac{1}{4}$ of water. By 7 months the milk may be pure; but a weakly child will still need a little added water.

Too much emphasis cannot be laid upon the importance of the added cream. If extra fat in some form is not added, the child cannot thrive. The fat can be obtained in several ways.

(1) The milk which is taken for the rest of the family can be set aside and the cream be skimmed off for the baby. (It will be necessary to make it clear to the children that it is not right to take the skimmed milk for the use of the baby and add cream to it, but *the cream must be added to the whole milk.* As mothers have been known to make this mistake in following out written directions, it is not unlikely that the children may make it as well.) To every pint of milk, before it has been mixed with water, it will be neces-

sary to add 4 ounces (8 tablespoonfuls) of cream obtained in this way. The difficulty is that only a very small quantity of milk is usually taken for a working-man's family. The cream is also apt to get polluted with dust whilst standing.

(2) *Separated* cream can be bought from the dairy. This contains a larger percentage of fat than cream which is skimmed off by hand, therefore less is required. Only about a quarter of the amount given above will be necessary. But dairy cream varies largely, some containing 16% and some 32% of fat.

It is better to get the dairy cream, if it can be assured that it contains no preservatives, such as boracic acid, which is considered to be injurious to the child's digestion. It will also probably be cheaper than skimming the cream off the milk at home.

(3) The extra fat can also be assured by using what is known as "top" milk (*see* Appendix). In this there will be double the amount of fat that is usual in cow's milk; and therefore no more need be added.

(4) Better still is it to dilute the milk with what is known as "fat-whey," instead of diluting it with water (*see* Appendix). If this is done, not only does the baby get the extra cream, but it also gets the benefit of the most easily digested of the proteid constituents, as also the extractives, both of which are in the whey.

During the first two or three weeks of life it will be well to dilute with a little water as well as the fat-whey; say 2 parts of fat-whey, 2 parts of water, 1 part of milk. But the water can soon be discontinued and the fat-whey be used altogether as a diluent. If the baby is a weakly one, rather less milk can be given (and more fat-whey) than that which is mentioned in the food-chart.

This method is the one which is in vogue among the out-patients at the Infants' Hospital, Westminster; and

the mothers make no difficulty about preparing the whey. The rennet is given to them.

(5) If adding cream by any of these methods is out of the question, on account of its expense, then, as the child *must* have extra fat, it is well to buy a small bottle of pure olive oil and give it out of a teaspoon *before* a meal. A commencement can be made with half a small teaspoonful once, and afterwards twice, a day; this can be increased until, at about six months, double that amount, or even more, may be given, according as it suits the child. The olive oil is likely to agree with babies much better, if it is given in the form of an emulsion (*see* Appendix). Cod-liver oil is an excellent substitute for cream, but costs more than olive oil.

The motions must always be carefully watched, when the baby is being given added fat; and, if they become too loose, the amount must be lessened or even withheld altogether for a time. Extra fat is a great preventive of constipation.

Sugar to the amount of four level tablespoonfuls must be added to each pint of *milk* (*before* it has been mixed with water). Whenever possible, milk-sugar should be used, as this is the natural form for an infant; but it costs more than cane sugar, being one shilling a pound. If it cannot be obtained, lump sugar must be used instead.

It suits some infants best to dilute the milk with barley-water instead of plain water, although it is open to question whether, as has been often asserted, this aids in breaking up the clot. It is best to use washed whole barley, as it contains less starch than prepared barley. It should be made fresh twice a day in the summer, as it turns sour very quickly.

Lime water is also found useful in some cases (*see* Appendix for recipes for both).

It is difficult for any but scientific experts to enter fully into the vexed question as to the advisability or otherwise of boiling the milk. The advocates for and against are equally emphatic. But it is acknowledged on all sides, that *raw* milk is the better food, and that cooked milk is an unnatural diet for an infant who, when breast-fed, obviously takes it raw.

But the difference between raw human milk and raw cow's milk is very great. The child receives its mother's milk direct into its mouth, pure and clean, without any chance of intermediate contamination. With cow's milk it is far otherwise.

The contamination may commence in the milking shed, where, frequently, the milker with unwashed hands milks the cows with unwashed and, maybe, tuberculous udders, drawing the milk into badly washed pails, or (worse still) pails which may possibly have been washed out with typhoid-polluted water drawn from a shallow well. The milker himself may be tuberculous, or may have been in contact with scarlet fever or diphtheria.

The milk, already polluted with the micro-organisms of putrefaction (for the multiplication of which it is an excellent medium), may then, instead of being rapidly cooled to prevent their increase, be put direct into cans and sent off many miles by train.

The contamination is added to in the retail shop where it is kept in an open bowl on the counter, into which the dust from the street, consisting largely of dried horse-droppings, finds its way. The dirty sediment found at the bottom of the milk-jug consists mainly of manure from the farm and street.

The dispute is centred round the question—which is the better food for an infant, dirty *raw* milk or dirty *cooked* milk? That both are harmful goes without saying; and

that the condition of a large amount of the milk on the market is a disgrace to the country, is also an indisputable fact.

Briefly, those who *advocate* boiling or sterilizing the milk, maintain that—although when so treated it may not be as nourishing an article of diet and, if scurvy is to be avoided, orange juice must be supplied to the infant in place of the anti-scorbutic property which cooking has destroyed—yet these evils are small, compared with the great risk that is run when the child is fed with milk that is swarming with injurious micro-organisms, and which may contain the specific germs of tuberculosis, enteric fever, or diphtheria.

Those who are *averse* to cooking the milk in any way maintain that, when so treated, the injury to the child is so certain and so great, that it is infinitely better to risk possible contamination. For, they say, not only is boiled milk less nutritious but, in addition, boiling destroys in the milk a powerful antiseptic, the *streptococcus lacticus*, which actually protects the child against such diseases as summer diarrhœa. Moreover, they add that the boiling *fails to destroy those germs which are most dangerous.*

The latter of these two opinions is rapidly gaining ground. At the Infants' Hospital, Westminster (the sole hospital for *infants only* in the country), only raw milk is given. True, this milk is particularly pure, being obtained from a special farm. But the infants in the Out-patients' Department have to be fed with milk obtained from retail dealers within a ten-mile radius of the hospital; yet the mothers are given printed directions emphasizing the point that they are on no account to boil, sterilize, or pasteurize the milk. It is interesting to note that at Bradford, where a laboratory for providing scientifically adapted milk is being instituted, the Public Health Authorities have also decided to give up sterilizing the municipal milk and to

supply it raw instead, as they have become convinced that it is the less dangerous method.

Those who feel sufficient interest in the question, will find it dealt with briefly in *Acute Intestinal Toxæmia in Infants*, by Ralph Vincent, and more in detail in his valuable book, *The Nutrition of the Infant.*

Teachers in *country* districts can undoubtedly do much by impressing upon the children the necessity for perfect cleanliness of cows, cowsheds, and milkers; by pointing out to them the fact that manure is not a natural constituent of milk, as many farmers would appear to think; and that, if milk is to be clean, the cows need daily grooming and the udders washed before the cow is milked. It will not be superfluous to remind them that milk is a perfect medium for the growth of bacteria, and, if those that are in the milk are to be prevented from increasing, it is of prime importance that the milk should be *cooled rapidly* immediately after milking.

By giving teaching of this sort, teachers in the country can take part in reducing the infant mortality in the towns which is caused by the importation of dirty milk.

It is most important that the milk should be kept cool after it has been taken into the house. This is best done by standing the jug, which must be scrupulously clean, in a basin of cold water. The jug should be covered over with a piece of clean wet muslin (butter muslin is very cheap) in order that the dust and flies may be kept out. It is well to sew a clean pebble in each corner of the cover to prevent its being blown off. It is best that these corners should dip into the water in the basin, as that will keep the muslin wet. The basin should then be placed in as cool a place as possible.

But, unfortunately, a working man's home has very little accommodation for the storage of food. Usually the

kitchen cupboard or a shelf at the head of the cellar steps is all that can be had. In back-to-back houses, where they face the south or south-west, even the window-sill cannot be utilized.

Much good can be done, however, if the children are made to see the *importance* of keeping the milk cool and covered up. Flies carry a great deal of disease about. They alight on offensive material, and then carry some of it on their feet, and deposit it on the food or in the milk-jug. Fly-papers should be used in all working-class homes; but, in addition, precautions should be taken to prevent the accumulation of offensive material on which the flies like to breed. All organic rubbish should be *burnt*; and ashes only should be thrown into the dust-bin. It is, of course, impossible to burn rubbish on a gas-stove; but in any case the lid of the dust-bin can be kept on.

In speaking of the feeding-bottle, great care must be taken to prevent the children always associating a baby with a bottle! It cannot be impressed upon them too strongly that a hand-fed baby is a baby to be pitied, as it starts life handicapped.

Every one ought to know by this time that a long-tubed bottle should never be used, as it cannot possibly be kept scientifically clean, *i.e.*, free from micro-organisms. Yet thousands of such bottles are still used. They are liked, because they save trouble. The bottle can be given to a baby in the cot. But that is an unnatural and dangerous way of feeding a baby. When fed by its mother, it *must* be held in the arms; and a baby needs careful watching, lest it should suck too quickly, or choke, or go to sleep in the middle of a meal.

Neither the tube nor the teat can ever be thoroughly cleansed, even with a fine brush; and the decomposed milk may set up serious intestinal trouble.

The only admissible feeding-bottle is one that has a teat which fits over the neck, and which can be turned inside out. There are now many quite cheap ones of this kind on the market.

The hole in the teat must not be so large as to allow the milk to *run* out, but it should come out drop by drop. The children should be taught to turn the bottle over *each time* before feeding the baby, in order to see that the hole has not become too large.

No milk should be left in the bottle after a meal; but it should be poured away *at once* and the bottle should be rinsed out, first with cold and then with scalding water. The teat must also be turned inside out, scalded, and put with the bottle, into a basin of *clean* cold water, which needs to be changed at least once a day. All feeding-bottles should be boiled once a day. This is of the greatest importance in hot weather.

It is very difficult, in a poor home, to provide the various jugs and basins which are necessary when a baby is fed artificially. But scrupulous care must be taken, or the child will eventually suffer. For night-feeding two clean bottles are necessary, as otherwise a dirty bottle will be used.

A bottle should always be marked with tablespoon and ounce measurements; and these must be looked at carefully, when the milk is being poured in. It needs to be given to the child at blood-heat, that is, 98·4°F., just comfortably warm. The heat should *not* be tested by taking a drink from the bottle; but if a milk thermometer (which can also be used for the bath) cannot be bought, it is well to test the heat by letting a few drops fall from the teat on to the inner side of the wrist. It should feel just warm.

A minute or two after a feed the baby should be laid down on its *right* side in the cot, so that the distended stomach may not press upon the heart.

On no account must a comforter then be put into the mouth. It should never be used; and, if the baby is never given one, it will not feel the want of it. A baby will lie quite happily and comfortably kicking in its cot, if it is taught to do so from early life. Here, again, the value of its capacity for education is experienced.

Diagram of Bottle sold at the Leeds Babies' Welcomes.*

The comforter is harmful in many ways. It is rarely scientifically clean. It is frequently dropped on to the floor, in the dust of which may be the germs of, *e.g.*, tuberculosis, as well as those which cause putrefaction. It is put again into the child's mouth, after having been either superficially wiped with an apron, or sucked by someone whose teeth may be decayed (decayed teeth give out poisonous matter, which is most injurious to the digestion), or who may be otherwise unhealthy. Frequently it is tied on to the child's clothing, where it hangs, moist and warm —a happy breeding-ground for micro-organisms. Although they may not be seen, they are there and only boiling will destroy them.

But even if it could be assured that the comforter was always clean, it would still be a most unwise thing to give

* Can be obtained from E. J. Arnold & Son, Ltd., Leeds, net 6½*d*.

a baby. The action of constantly sucking a comforter may cause such a change in the roof of the mouth that actual deformity, such as that of projecting teeth, may result. Bearing in mind the rapidity of growth of an infant, this is not difficult to understand; and it is the confirmed opinion of dentists of high standing that the comforter is often responsible for such a change.

CHAPTER XI.

ARTIFICIAL FEEDING: PATENT FOODS.

Among artificial preparations, condensed ("tinned") milk is the greatest favourite. There are a large number of brands, but they may be all classed under one of three headings:—

(1) Condensed *skimmed* milk, which may be dismissed at once as a starvation diet for a baby.

(2) Condensed whole milk, sweetened.

(3) Condensed whole milk, unsweetened.

That which is sweetened is the cheapest and is most commonly used. But the excessive sweetness caused by the addition of cane-sugar as a preservative, makes it necessary to dilute it to such an extent that it can hardly be called milk. Most serious of all, however, it is largely deficient in fat. The unsweetened is better, containing, as it does, lactose instead of cane-sugar; but the fat is also deficient.

Condensed milk is a handy sort of food, and it is easily mixed; but in cottage homes the tin is frequently left lying about open on the kitchen table, where it becomes contaminated by dust and flies.

Of the many other patent foods much might be said, but it is only necessary to speak of them in order to condemn them. They nearly all consist of milk which has been

dried and sweetened, and to which *flour* in some form has been added. Starch, as we know, is the main ingredient of flour.

These foods may practically be divided into those which contain free starch, and those in which the starch has been converted into maltose or dextrine. The free starch is the more pernicious; for, as has been shown, it is practically incapable of digestion by the infant.

But even when the carbohydrates are present in the form of either maltose or dextrine or cane-sugar, they must be looked upon as substances altogether foreign to an infant's natural food, and on that account, as objectionable. Milk contains one form of carbohydrate and one only; and that is lactose—milk-sugar.

All preserved foods are also lacking in the anti-scorbutic element; and all are more expensive than fresh milk.

The result of the large use of all these proprietary foods is most disastrous. Infants which are fed upon them may appear healthy, and they are usually very fat, the fat being due to the excess of sugar in the diet. But they lack vitality and easily succumb to infectious diseases. Moreover, and principally, they are very prone to rickets, the result, mainly, of deficient fat.

Seeing that these foods are so expensive, we may well wonder that they should be so largely used; their great sale shows the powerful effect of widespread advertisements.

And, after all, how can the mothers, with their limited opportunities of obtaining any knowledge of dietetics, be expected to judge as to the truth or falsity of the advertisements? These foods are described by their makers as perfect and ideal foods, and as real substitutes for mother's milk. Booklets are given with the foods, giving lengthy instructions on the feeding and care of an infant. These the mothers carefully read, so anxious are they to do their

best by their babies. How are they to understand the significance of such terms, as, for example, "completely malted"? And even if they did, how are they to find out whether such statements are true? The unrestricted sale of these patent foods is undoubtedly a menace to the health of the nation.

As a rule, a mother does not begin by feeding her baby upon a patent food; but the child may be at first either breast-fed or fed on fresh milk. But, owing often to irregularity in feeding or want of knowledge in mixing the milk, the digestion becomes disturbed, the child is frequently crying, and the trouble is put down to the fault of the milk itself. The mother says that the baby is not "satisfied," but that it needs something more "strengthening," and so she gives it one of these unnatural foods. It is not denied that many of them (particularly those in which the starch has been converted) are easy of digestion. The process of preparation has, for one thing, caused the curd to be broken up; but the great cause of their easy digestibility is the fact that there is so little food in them to digest. They are, in fact, seriously wanting in the materials which are essential for healthy growth and development.

The evil results are sometimes slow to show themselves sufficiently to attract the attention of any but skilled observers; and the mother continues to be in ignorance of the fact that her child, whom she regards as quite healthy, is, in reality, suffering from malnutrition.

A preparation of milk, which is coming rapidly into public favour, is dried milk. During very hot weather, in crowded centres where proper storage of milk is impossible, the use of dairy milk may be positively dangerous, both on account of the difficulty in keeping it sweet (even if it is delivered sweet at the house), and also on account

of its contamination by dust and flies. At this time a good dried milk is a real boon as a preventive of summer diarrhœa, that fatal disease of infancy. It keeps sweet for a long time and only needs added water to bring it back to its original consistency. Some of these preparations are made from skimmed milk, others from whole milk, whilst others again have not only added cream, but added sugar of milk. Needless to say, these last are the best.

Dried milk can hardly be recommended as a permanent diet, mainly because of the heat to which it has been exposed in the process of desiccation and the consequent destruction of the anti-scorbutic element. But many infants doubtless thrive and develop well on it, when they are unable to digest fresh milk. A gradual return should certainly be made to the fresh milk as soon as possible; until then, orange juice should be given twice a day.

It is wholly unnecessary and inadvisable to add any "thickening" to milk until the child is about six months old, when the teeth ought to be coming. If the baby appears to be thriving and is gaining weight regularly, it may be postponed until the age of seven, eight, or even nine months; and then, instead of wasting her money on any of the patent foods, the poorest mother can herself prepare baked flour at home.* The baking results in the partial conversion of the starch. Half a teaspoonful in two of the bottles should be given daily at first; and this can gradually be increased until the child is having a teaspoonful in each bottle.

Other preparations from flour and from bread may be given at this age, such as flour ball* and bread jelly; but the preparation of these is not so simple.

Mention must be made of an exceedingly common article of infant diet; and that is what is known in the

* *See* Appendix.

North as "pobs." It is simply boiled bread and water with or without milk, made into a pap, with the addition of sugar; no special quantity of milk appears to be measured.

This mixture is actually given to thousands of children from earliest infancy, either as their staple diet, or in addition to breast-milk. What wonder that so large a number of the children so fed should suffer from the general wasting known as marasmus, or develop rickets and fall a prey to convulsions or some epidemic disease which they have no strength to fight against?

White bread may be said to consist approximately of:—

*51½% carbohydrates (principally starch, with sugar and dextrine);
6½% proteids;
1% fat;
1% mineral matter;
39% water; also gas.

What similarity has this food to mother's milk? It is, it is true, highly convenient, as bread and water are always in the house and sometimes a little milk; but its use must, of course, be emphatically condemned until the baby is nine or ten months old, and even then such starchy food should be given only very sparingly. Sometimes biscuits or rusks are substituted for the bread; but, as these all contain a large amount of starch, they, too, must be avoided. Worse still are mixtures of arrowroot or cornflour, both of which consist mainly of starch.

Many babies are rarely seen without a crust or a piece of biscuit in their hands, which they are constantly gnawing or sucking. They even take it with them into the doctor's consulting-rooms in the out-patients' departments of the

* Hutchison's *Food and the Principles of Dietetics.*

hospitals. When the mother is questioned by the doctor, she assures him that baby has "nothing but milk," in spite of the incriminating evidence, and quite ignoring any possible connection between the crust and the infant's digestive trouble. Small wonder that its digestion is upset when the stomach has no rest, apart from the danger of the starchy food!

One most disgusting custom needs to be mentioned because it is so very common. A large number of mothers are actually in the habit of giving their babies to drink a teaspoonful or so of the urine which the child itself has passed. What appalling ignorance and folly thus to return to the child's body the effete waste substance which Nature has eliminated! Surely teachers could do something to prevent the continuance of this pernicious custom, for which it is difficult to give any definite reason, although there seems to be an idea that it clears away thrush and keeps the mouth clean.

The children should be made to understand very clearly the great truth that, as a house that is built badly with poor materials ("jerry-built") cannot last, but will soon show cracks and give way in various directions, however pretty and good it may look at first—even so, unless the body of an infant is built up with the right materials for making healthy bone and flesh and fat, it, too, will inevitably show the results sooner or later. Rickets and other diseases of malnutrition will be dealt with more particularly in the next chapter.

The teacher will, of course, speak to the children of other improper foods which are so often given to young children.

It is a common custom for a mother to allow quite a little baby to sit on her lap at meals, and to give it bits from her own plate—"just a taste," she will say—and sips out of her own cup of tea, because "he *will* have it."

It is in regard to matters of this sort that careful and persistent teaching of the children (without, if possible, reflecting on the mother) can do so much good. Apart from the injury to the child's digestion, the want of discipline which is shown by the above-mentioned practice is very serious. What would be said to a nurse if, to save herself the trouble of training a child, she were to feed it in this way? The children of the more fortunate classes *have* to learn to see others eat, without eating the same food themselves. There is no difficulty whatever in accustoming a baby to this; if a mother were never to *begin* giving "bits" and "sips," the baby would never want them and never give the least trouble. Again, it is all a matter of *habit*, and of the child's capacity for education.

Tea cannot be too strongly condemned for infants and young children. It is injurious, firstly, because of the tannin which it contains, and which interferes seriously with the digestion, making the process a very slow one and, in some cases, even irritating the mucous membrane of the stomach. Very strong people may sometimes be able to drink strong tea with impunity; but it is far otherwise with a delicate organism, such as that of an infant.

Secondly, the caffeine (or theine), which is a stimulant and that part of the tea which gives an adult the delightful feeling of "pick-up," excites the central nervous system (which in a child is so unstable), producing nervousness, "jumpiness," and irritability. The mother may not notice this, or, if she does, she may not attribute it to the right cause; but the fact remains that both tannin and caffeine are poisons to an infant.

No baby should be given solid food until it is one year old. At the age of ten months it may be given broth or beef tea* (*free from fat*) once or twice a week. These foods

*See Appendix.

are not particularly nourishing, not nearly so much so as milk; but they serve as a beginning, in order that the child may be gradually accustomed to other food.

At one year it will be well, if possible, to dispense with the bottle and feed with a spoon; and let the child begin to drink out of a cup. The change must be begun gradually; some children are much later in dispensing with the bottle than others. Patience and perseverance are needed; and it is not "naughty," but perfectly natural, for a child to refuse to give up the old method to which it has been for so long accustomed.

Even during the second year milk must be the principal food. Solid food can be begun by giving a little bread and milk at breakfast. A few days later the dinner-time meal can be varied by red gravy from the joint, with *stale* bread-crumbs (new bread should never be given, as, on account of its moistness, it is not as readily acted upon by the saliva); or gravy with a little *well-boiled* potato mashed up in it; or a *lightly* boiled egg, mixed with bread-crumbs. The white of the egg should not be set, as it is then very difficult of digestion.

On the days when beef-tea or broth is given, some well-cooked semolina or stale bread-crumbs may be mixed with it. At this time custard and thin semolina puddings may be added, and also the pulp of a baked apple.

At eighteen months, a little well-cooked oatmeal porridge, made with rolled oats (such as Quaker or Provost oats), may be alternated at breakfast with bread and milk; and thin bread and butter, with the butter well rubbed in, may be added as well.

Small quantities of boiled or stewed fresh fish may also be commenced. Cod and plaice are cheap and as good as any. Neither fried nor salt fish must be given.

Soups of all kinds, made from meat and vegetables,

but with both taken out, as also boiled fowl (a luxury), may also be added to the diet and be followed by small quantities of meat. This should be underdone, should be cut from the joint, and be very finely minced up, with all gristle and skin and most of the fat removed. At this time the child should take its fat in the form of the cream of milk and butter.

Vegetables should be given sparingly at first. *Well-boiled* cauliflowers, celery, spinach, and French beans are the best. No raw vegetables or fruit (other than a little mashed banana) should be given.

How different is this simple diet from that which is so often given to babies! Yorkshire pudding is given from a very early age in the North, but it is not a digestible form of pudding. A child should have no fried food, or that which is rich, highly seasoned, or tasty, for some time to come. Cheese, kippers, pork-pie, pastry, fried fish—anything and everything are given! What wonder, then, at the frequency of convulsions and other manifestations of digestive disturbance?

Great attention must always be paid to mastication. When a child has teeth, it must learn to use them and to eat slowly.

In these chapters on feeding, it has been the writer's purpose to avoid an excess of technical detail. A general outline of the diet of a *healthy* child has alone been dealt with.

In conclusion, it should be observed that pre-digested foods, such as Benger's food and peptonized milk, should never be given without doctor's orders, as they tend to make the digestive apparatus incapable of acting by itself. In disease they are valuable; but the doctor alone is capable of judging as to when their use is advisable.

CHAPTER XII.

SOME DISEASES OF INFANCY.

How is it to be known that a baby is thriving ?

(1) It must gain in weight regularly. After the first week, and until the end of the third month, this gain should be at the rate of from five to six ounces per week. After that time the increase becomes gradually less, until between the sixth and the ninth month it is from four to five ounces a week, and from the tenth to the twelfth month four ounces a week. The average weight at birth is seven pounds, and this should be nearly doubled by the end of five months.

The gain in weight is a most valuable criterion of healthy development. Weight charts are kept of all infants attending Hospitals, Babies' Welcomes, and Schools for Mothers ; and the mothers show the keenest interest in the weekly weighings, evincing great disappointment when there is a loss. Unfortunately there are still large numbers of people who consider it to be " unlucky " to weigh a baby. These are by no means to be found only among the poorest of the population ; but those who ought to know better will give instances of babies who " never got on " after they had been weighed, and express conviction that the weighing was the cause of the trouble.

(2) The child must sleep long and quietly.

(3) When awake, it must be contented and bright, enjoy exercising its limbs, and only cry for some *reason*, such as hunger, fatigue, or discomfort.

(4) It should have a good appetite.

(5) The flesh should be firm, not flabby and not too fat.

(6) The bowels should act regularly ; at first from two to four times a day and, later, once or twice a day. The motions after the first week—during which time they are of

dark greenish brown colour, and are composed of a mixture of bile, mucus, and epithelium, scientifically known as meconium—should be bright-yellow and of the consistency of mustard, with practically no smell. They should not be green, nor pale like putty; and they should not contain curd, slime, or blood.

Towards the end of the second year the motions should be formed and be in colour and odour similar to those of an adult.

(7) The teeth should appear at the right time.

In addition to being familiar with these indications of good health, it is necessary that all who have anything to do with babies should know the ordinary symptoms of the most common ailments to which they are liable. All of those mentioned here will be seen to be either directly due to *improper feeding*, or else closely associated with it.

Rickets.

Although most people associate this disease only with the marked characteristic of bony deformity (indeed it is its most obvious feature), yet it affects the child's whole constitution as well. If only the early symptoms were better known, as also their cause and their treatment, but few, if any, of the cases would progress sufficiently to result in deformity.

Rickets are rarely seen before the age of six months or after the third year, although the resulting deformities may continue through life. The commonest time for the disease to show itself is between ten and twenty months. The baby may appear quite healthy, being usually fat, and rickety babies have even been known to gain prizes at Baby Shows!

Want of fat in the diet has already been indicated as the prime cause of rickets. This is aggravated by such un-

hygenic conditions as want of sunlight, fresh air, and warmth. The child may have been, and often has been, *overfed*, but with starchy foods.

The first symptoms are :—

(1) Restlessness, particularly at night. The child tosses itself about and throws off the bedclothes.

(2) Profuse sweating of the head and neck. The pillow will be found to be quite wet.

(3) Enlarged abdomen.

(4) Usually constipation, although there may be slight attacks of diarrhœa.

The later symptoms are :—

(1) Increased constipation.

(2) Muscular weakness, resulting in late walking.

(3) Enlarged fontanelle.

(4) Late teething.

(5) Swellings at the ends of the long bones, particularly noticeable at the wrists.

(6) Beadings, or little knot-like growths on the ribs, where the bones join the cartilage ; these are known as the "rosary" of rickets.

(7) Bending of the long bones, both of the legs and arms, and knock-knee.

(8) Broad, protruding forehead and flat, large head.

These are the main symptoms. The principal features are the want of sufficient hard earthy matter in the bones and delayed muscular development.

Not only are the majority of mothers ignorant of the significance of the earlier symptoms, but, even when the grosser symptoms show themselves, they are loath to take any action owing to their confidence that the child will "grow out of it." The important thing is to persuade them to take action when the disease is threatening.

All hygienic precautions must be taken. Starchy foods

must be discontinued, or given in small quantities according to the age of the child. Fat, in the form of cream or cod-liver oil, is absolutely necessary; and so is plenty of fresh milk—also eggs, if the baby is over ten months old. (Cod-liver oil is given from the hospitals.)

If the bones have begun to bend, the child must be *kept off its feet*. This is a real trial for a working-class mother. Splints must be worn; but alas! although they may be put on at the hospital, they are frequently taken off at home. The child naturally frets very much at first and needs a great deal of attention; how can a busy, hard-working mother give it the requisite attention, when it is one person's work to look after an invalid child? And yet many persist most valiantly in following out the doctor's orders, and with most happy results. But many are the families where the mother is burdened with two or three children, all unable to walk.

If the bones have not been straightened by the time the child is about four years old, the probability is that a surgical operation will be necessary. Many parents shirk this operation; and this accounts for the numerous cases of bow-legs and knock-knees which are to be seen in the large cities. It is even quite common for bow-legs to be looked upon as hereditary. When the mother's attention is drawn to them, the reply is not seldom given that "it is all right, his father has bow-legs too." Mothers also call the enlarged epiphyses "double-joints," and appear often to be rather proud than otherwise that their baby should be "double-jointed."

Rickety children are prone to convulsions and bronchitis; if they contract such a disease as whooping-cough or summer diarrhœa, it goes very hardly with them. If rickets could be prevented, the infant mortality-rate from many diseases would be reduced.

Scurvy.

This is also essentially a food disorder. Breast-fed children never contract it; but it is liable to arise if a child is fed entirely on such a diet as tinned milk, patent foods, or milk that has been boiled or sterilized. This is because of the destruction of the anti-scorbutic element in the food. The disease may be associated with rickets, for obvious reasons, but it is of far rarer occurrence.

The first symptoms are depression, anæmia, muscular weakness. These are soon followed by the characteristic symptoms of tenderness and swelling of the limbs, causing the child to cry when handled. The gums are soft, spongy, and sometimes so swollen as to protrude from the lips. They bleed readily and ulcerate, giving a most offensive odour. These extreme symptoms may commence with simple discoloration of the gum round a tooth which is coming through; the gum looks purple. There are many other symptoms of scurvy which it seems unnecessary to mention, as these are the typical ones.

The cure is one of diet only, the giving of anti-scorbutic food—*i.e.*, fresh milk, orange juice, fine potato gruel,* and raw meat juice.* The cure is usually rapid.

Marasmus or Atrophy (Wasting).

This disease must not be confused with the condition of an infant that has been born delicate or immature; but, on the contrary, it is the condition of a child, who, though born healthy and progressing at first, wastes later on, owing to wrong feeding.

Wasting frequently occurs as the concomitant of other diseases, but these are not under consideration now.

Marasmus is frequently caused by overfeeding. The first signs are simply those of indigestion—discomfort

* *See* Appendix.

after food; drawing up the legs with pain, and wind; irregular actions of the bowels, and often green and offensive stools; fretfulness and frequent crying. In fact the child is spoken of as "a troublesome baby" and is the sort of one that is dosed with all sorts of patent medicines.

If the conditions continue, the child loses weight and becomes very emaciated. The fat beneath the skin disappears and the skin hangs in folds on the limbs; the face is so wrinkled that it looks like that of an old man, with an expression of utter misery. The skin is dry and sallow. The child is usually very restless.

When babies are in this condition, they need the utmost care if their lives are to be saved. Their digestive apparatus has been so injured that it is wholly incapable of doing its work; and only very gradually can it be brought back to its normal condition. The child must be under the care of a doctor, as it will need medicine as well as very careful dieting. Great care is also necessary to keep it warm; if chilled, it may rapidly collapse. It ought also to be kept quiet and not be disturbed unnecessarily.

Summer Diarrhœa (*Zymotic Enteritis.*)

A baby may suffer from vomiting and diarrhœa at any time of the year. It is then nearly always a sign of digestive disturbance, but may also be due to a chill, usually contracted by exposure of the legs and abdomen. Summer diarrhœa, which kills more infants than any other disease, has a different origin.

This is essentially a *dirt* disease and is preventible, for it is caused simply and solely by polluted milk, milk that has been contaminated by the organisms of putrefaction, which are much more numerous in hot, dry weather than at other times. The largest number of deaths from summer diarrhœa occurs among children who have been fed on

tinned milk. This may be due in part to the lowered vitality of children so fed, in part to the fact that the tins are usually kept lying about opened on the kitchen-table, where they are contaminated by dust and flies, and in part to the fact that the *streptococcus lacticus*, already referred to in Chapter X., has been destroyed by the prolonged heat necessary for the preparation of the milk.

The disease is most prevalent during the months of July, August, and September, after hot, dry weather. A wet cold summer means a reduction of the infant mortality-rate.

The organisms of putrefaction produce a change in the milk which turns it into a poison, sometimes so virulent as to destroy the child within a few days. Breast-fed infants are practically immune.

Although preventible, the means of prevention are by no means wholly within the control of the mother; for, as has been shown, the milk may quite possibly be contaminated long before it reaches the house. But she can at least be extremely careful as to scrupulous cleanliness of jugs, basins, bottles, etc.; and she should always keep the milk covered with muslin—as has already been directed. But in many workmen's homes it is quite impossible to take adequate precautions; and this fact, coupled with that of the possibility of previous contamination of the milk, makes the use of dried milk in such circumstances invaluable.

The infants most liable to be affected fatally are those who have had digestive trouble for some time previously, particularly rickety children. But even a healthy child may fall a victim to it.

The symptoms are unmistakeable—restlessness, vomiting, and rapid rise of temperature, followed by diarrhœa; or the diarrhœa may come first and the vomiting later.

Undigested food is vomited at first; then the ejected matter becomes very watery. The motions, at first fairly normal in consistency, change in a few hours to the appearance of dirty water and are extremely offensive; they may be so frequent as to be almost continuous. The child's appearance changes rapidly, the face becomes ashy grey, the cheeks and eyes sink in, the emaciation becomes very marked, and the little sufferer lies exhausted and helpless. The disease is a most terrifying one to the mother, who feels helpless in face of such rapid development.

If an infant is so seriously ill as this, before receiving medical attention, its life will be saved only with difficulty.

If, however, the attack comes on gradually, commencing with slight symptoms (say, a green motion four times a day), the mother may be able to arrest it herself by *stopping all food* for twenty-four hours and administering nothing but boiled warm water. The child will be thirsty and drink it greedily. If, at the end of ten or twelve hours, the diarrhœa has stopped, there may be no need for medical advice; but the starvation must be continued to the end of the twenty-four hours, and then albumen water may be given*—two teaspoonfuls every half-hour at first; and the intervals and quantity must be gradually increased, until a tablespoonful is given every hour. Milk must be recommenced only very gradually; and it will be much safer to let this be dried milk until the dangerous season is over.

If the preventive measures do not have the desired effect, the child will need medical treatment *at once*; no time must be wasted.

It will be absolutely necessary to wash out the bowel in order to get rid of the poisonous material, as well as to keep the stomach empty of food for a time. But the exhaustion

* *See* Appendix.

is so great, owing to the loss of liquid from the body, that a saline solution is given either by the mouth (the infant, in its great thirst, drinking the salt and water greedily), or else by subcutaneous injection. This latter has the most wonderful and rapid effect upon an apparently dying infant.

The difficulty is that some mothers are so afraid of these measures, which to them appear so drastic, that they are afraid of taking their babies to those hospitals where the treatment is in vogue; others, even though they take them, fail to carry out the doctor's orders as to restricted diet, with the result, frequently, of relapse and death. Many also fail to realize the importance of treating these infants with the utmost care. However hot the weather is, their extremities will be cold; and they need artificial heat in the form of a hot-water bottle or hot brick. They also need a woollen adbominal belt. They should not be kept in a hot stuffy room, close to the fire, as is so frequently done; but, although, on account of their lowered vitality, they need warmth, for the very same reason they need fresh air. Draughts and undue exposure must, of course, be avoided.

The child should be moved about as little as possible, although the clothing and bedding must be kept clean—no easy matter with a child in such a condition. A mother with such a child to nurse needs all the help and encouragement that can be given her.

Convulsions.

In the very early days of life, convulsions may be the result of undue pressure on the head during birth, although, even as early as this, an unsuitable diet may be the cause.

Most frequently the convulsions of infancy are due to colic, as the result of indigestion. Rickety children are

particularly prone to convulsions. But it must not be forgotten that frequent convulsions may be indicative of such a disease as meningitis, or may mark the onset of a severe illness, or be the result of worms in the intestine, or of difficulty in cutting a tooth.

Convulsions are more common in infancy than in later life, because the nervous system is so sensitive and unstable at that time. The reason for the fits should always be ascertained; and therefore medical advice should be sought.

In mild attacks the lips turn pale for a moment and the face and hands twitch; the fit ends with a catch in the breath. In some severe attacks, after a sudden cry the body and limbs stiffen, the face turns blue, and for a few seconds the child does not breathe; the fit usually ends by twitching of the face and hands, and then the breath is drawn. One fit may follow another.

The child should be undressed and put into a warm bath as quickly as possible; and the head should be bathed with cold water.

If indigestion is the cause, then a dose of castor oil should be given. The mother may remember that the baby has been given some unsuitable article of food. In any case, the castor oil can hardly do harm, as long as the child is kept warm afterwards. Careful attention must be paid to the diet in the future.

Constipation.

Constipation is generally associated with errors of diet; or it may be caused by weakness of the abdominal muscles.

Constipation in breast-fed children may be controlled by the addition of stewed fruit (particularly prunes and figs) to the mother's diet, and oatmeal porridge for break-

fast. In obstinate cases this may do no good ; and recourse is often had to frequent doses of castor oil. No greater mistake could be made. It is just the way to sow the seeds of life-long constipation. Castor oil will remove the obstruction in the bowel, but will make the bowel still less capable of acting for itself. Useless, too, as a *cure* are injections of glycerine or oil, and for the same reason.

Massage of the abdomen often does wonders. But the proper method of carrying this out should be shown to the mother ; otherwise she may do more harm than good. The baby must be undressed to its vest and laid flat on its back on the bed. The abdomen must then be gently kneaded round and round with the ball of the hand. It is easy to recollect the right *direction* by remembering that, when facing the child, the hand must move the same way as the hands of a clock. This is the direction that the coils of the bowel take ; and, if it is not adhered to, a rupture may be the result.

Massage will strengthen the abdominal muscles and enable them to act more forcibly for themselves.

Constipation will never be cured by drugs ; but, as it is frequently caused by a paucity of fat in the diet, it is often relieved by giving the child a teaspoonful of olive oil once or twice a day, or even oftener. If the child is already having an adequate amount of fat in its food and is still constipated, no remedy could be better than liquid paraffin. It is procured from the druggist and is colourless, odourless, and tasteless. For an infant of, say, three months of age, it is well to commence with half a teaspoonful per day before a meal, this can be increased to one teaspoonful and may be given several times a day if necessary. The paraffin is not absorbed into the system but lubricates the bowel automatically.

It must never be forgotten that constipation is a dangerous condition and should never be ignored, as it so frequently paves the way for other diseases.

Rashes.

Of infantile rashes, red-gum (strophulus) is perhaps the most common. It consists of bright red pimples, which are generally on the face, though they may cover the whole body. Red-gum is not usual in children over one year old.

Nettle-rash (urticaria) is more troublesome and occurs in early childhood as well as infancy. It consists of raised flattened wheals, surrounded by a red area; fluid may appear in the wheals. The irritation is great.

Both these rashes are caused by a disordered digestion. Children who suffer from constipation are most liable to them.

An aperient, preferably fluid magnesia, should be given; and attention must also be paid to the diet, which is sure to need revision.

The rashes of infectious diseases are beyond the scope of the present work.

Eczema.

This is a much more serious and complicated disorder; and a doctor should always be consulted. It is often very difficult to cure. Some error in the diet is frequently responsible, such as sweet, starchy foods. The appearance is usually that of a damp, red, discharging surface, with patches of dried-up scales. The irritation is intense. The child's general health needs attention, as well as the eruption; therefore ointments and lotions alone will rarely cure the disease.

Soap and water should not be used in cleansing the affected parts; it is best to use sweet oil when necessary.

The child must wear clean white cotton gloves at night, to prevent him scratching himself.

Vaccination.

Although the condition immediately following on an infant's vaccination is not a disease in the true sense of the word, and most certainly not a food-disorder, yet this book would be incomplete without some reference to the subject.

One cannot do better than quote the following words of Dr. Hellier.* "Of the safety and efficiency of good vaccination it is not necessary to speak here. There is no surgical procedure, however simple, in which the precautions of surgical cleanliness can be dispensed with. In addition to pure lymph, a clean arm, and a sterilized lancet, the scratches and pocks themselves must be kept clean. When one thinks of the dirtiness of some of the infants brought to public vaccination stations, of the filth of their clothes and surroundings, the uncleanliness of those who nurse them, the various applications made to the arms by ignorant people, and the possible existence of discharging wounds and sources of septic infection on the persons of those with whom the infants come in contact, one cannot fail to be impressed with the small amount of evil that ever results from vaccination."

The wound must be protected; and this is best done by spreading some *fresh* boracic ointment with a *clean* knife on to a *clean* piece of boracic lint, and securing it in its place on the arm by two strips of plaster going the whole way round the arm, one above and one below the spot.

Bad poisoned arms have been caused by putting Fuller's earth on the vaccination sores.

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* *Infancy and Infant Rearing.*

APPENDIX.

Barley Water.

Barley water is made most easily by using Robinson's patent barley; but this contains more starch than that which is made with whole barley and also costs more.

The best way is to take ½-oz. (1 tablespoonful) of whole barley, wash it, and boil slowly in a pint of water until it is reduced to two-thirds of a pint; then strain through muslin.

Barley water turns sour very quickly and should be made twice a day in summer. On this account Robinson's patent barley is the more convenient.

Lime Water.

Put 2 oz. of *pure* hydrated lime into a quart bottle, fill up with pure water, shake well, and allow it to stand. The clear upper portion is that which should be used. Two teaspoonfuls should be added to each 5 oz. of food mixture.

Whey.

Heat 1 pint of skimmed milk to the temperature of 100°F., adding 1 teaspoonful of rennet, which must not be salt. When the curd has separated from the whey, break it up well with a fork, and strain.

Oil Emulsion.

Put equal parts of olive oil and lime water into a bottle and *shake well* for a few minutes. Give from ½ to 1 teaspoonful in a spoon before feeding. This mixture keeps well and is very cheap.

Raw Beef Juice.

Take a piece of good rump steak, cut off all the fat, mince it finely and add cold water in the proportion of

one part of water to four of meat. Stir well together and let it soak, cold, for half-an-hour. Then squeeze the juice from the meat through muslin, twisting the muslin well. This juice turns sour very quickly and should be made twice a day in summer, and kept in as cool a place as possible.

Beef-Tea.

Take ½-lb. beef steak, cut off all the fat, cut up the beef into small pieces; add 1 pint of cold water and a little salt, put it into a jar, and tie it down with brown paper. Stand the jar in a saucepan of cold water, put on the fire, and allow the water in the saucepan to simmer (not boil rapidly) for 2 hours. Pour into a basin and, when cold, take off the fat.

Flour Ball.*

Take a pound of pure wheat flour and tie it up very tightly in a pudding cloth. Boil for ten hours in water; at the end of this time there is produced a yellowish-white ball. When cold, the softer outer coating is cut off and the hard core is grated to a fine powder. A child of six or seven months can take in twenty-four hours two teaspoonfuls or less of this food. It is given twice in the day. A teaspoonful of the powder is made into a smooth cream with a little milk, and is then mixed carefully with a quarter of a pint of boiling milk poured slowly upon it whilst stirring.

Baked Flour.

Bake some pure wheat flour in the oven until it is a light brown, reduce it to a fine flour with a rolling pin, mix to a paste with a little cold milk and then with the feed of milk; commence with a teaspoonful in one or two bottles.

* Eustace Smith *Wasting Diseases of Children.*

Potato Pulp.

Take a well-steamed floury potato, rub it thoroughly through a fine sieve, beat it up well with milk until it is smooth and of the consistency of thin cream. A teaspoonful of this may be added to each bottle at first, and the amount gradually increased to two teaspoonfuls or more.

"Top" Milk.

Let a quart of milk (or half the amount, if it can be made twice a day) be stood in a covered jug in a cool place for five hours, after which remove the *top half* by skimming.

Directions for Making Fat-Whey.

(*Copy of a leaflet issued in the Out-Patient Department of the Infants' Hospital, Westminster.*)

(1) Add 4 drops of the special rennin* to 1 quart of (whole) milk.

N.B.—The milk must be quite fresh. It must not be boiled or sterilized or pasteurized, and must not have any preservative in it.

(2) After adding the rennin, warm the milk in a clean jug surrounded by water in a saucepan. When the milk is at blood temperature (100°F.), remove the saucepan from the fire.

(3) Stir the milk in the jug until the curds are well formed; at the same time press them to the bottom of the jug with a spoon.

(4) When the curds are formed into a solid mass at the bottom of the jug, place the saucepan again on the fire and boil the *water* round the jug for one minute.

(5) Pour off the whey and use as directed.

* This is Hanson's Extract of Rennet. If any other is used, it should not be salt, and the special directions should be carried out.

Pattern of Baby's Vest.

Knit very loosely.

Required—2 oz. 3-ply Vest Wool.
2 Bone or Wooden Knitting Needles, Size 8.
1 Bone Crochet Hook.

Cast on 52 stitches. Knit in ribbing 2 plain, 2 purl, to the end of the row, and repeat till 9 inches in length.

For the shoulder strap, knit plain 14 stitches. Cast off 24. Knit the remaining 14 stitches and work upon these for 24 rows, backwards and forwards.

Break off the wool and start the other strap. Work on this for 24 rows also.

Then cast on 24 stitches and pick up the 14 stitches that have been on a spare needle for the other strap. Work in ribbing like the front, 2 plain, 2 purl.

For the sleeves, put a pin in the centre of the shoulder strap and pick up 20 stitches on either side of it. Knit these in ribbing 2 plain, 2 purl, for 5 inches, decreasing twice (2 stitches every 4 rows) when there will be 36 stitches left.

Add a cuff 1 inch long of 1 plain, 1 purl. *Cast off very loosely.*

Do the other sleeve in the same way.

Sew up the sides of the vest and sleeves neatly, but very loosely. Crochet an edging round the top and run in a ribbon or a crocheted wool chain.

Pattern of Baby's Belt.

Required—1 oz. 3-ply Vest Wool.
2 Knitting Needles, Size 11.

Cast on 81 stitches. Knit in ribbing 3 plain, 3 purl, for 2 inches, then knit plain for 3 inches, finishing with 2 inches of ribbing, 3 plain, 3 purl, as at the beginning, making 7 inches in length. Sew the sides evenly together.

Books to which the Teacher can refer for further Information.

Infant Mortality. By George Newman. *Methuen & Co.* 7/6 net

Infancy and Infant Rearing. By John Benj. Hellier. *C. Griffin & Co., Ltd.* 3/6

School Hygiene and the Laws of Health. By Charles Porter. *Longmans, Green & Co.* 3/6

The Growth of the Brain. By Henry Donaldson. *The Walter Scott Publishing Co., Ltd.* 3/6

Education of the Central Nervous System. By P. P. Halleck. *Macmillan & Co., Ltd.* .. .. .. 5/- net

The Development of the Child. By Nathan Oppenheim. *Macmillan & Co., Ltd.* .. .. 5/- net

The Nutrition of the Infant. By Ralph Vincent. *Bailliere, Tindall & Co.* .. .. 10/6 net

Acute Intestinal Toxæmia in Infants. By Ralph Vincent. *Bailliere, Tindall & Co.* .. .. 3/6 net

Food and the Principles of Dietetics. By Robert Hutchison. *Edward Arnold* .. .. 16/- net

INDEX.

INFANT CARE AND MANAGEMENT.

THE "A.L." "BABYCRAFT" GARMENT PATTERNS.

Prepared by **EDITH L. MAYNARD,** *for use in conjunction with her book.*

The **Set of 3 patterns**—Pilch or Over-Knickers, Flannel Petticoat or Barrow, and Flannel Gown (no pattern needed for napkin), and full Instructions for making the **Knitted Vest, Sock, Belt,** and **Bonnet** (*see Illustration, page* 41), in stout envelope net **6d.**

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Pilch or **Over-Knickers**	net **3/9**
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This book, written in a chatty and interesting manner, is full of valuable information on this most important subject. Besides telling both what to do, and what *not* to do with a baby, it emphasizes throughout the importance of absolute cleanliness in everything, regularity of habit, and the value of patient watchfulness.

The book is for use by the girls in class or at home, and deals with —Baby's helplessness; Baby's head and brain; Baby's sleep; Baby's clothes, bath, and food; Taking baby out, etc.

INFANT CARE AND MANAGEMENT.

THE "A.L." "MODEL BABY" DOLL.

Height 21-in.; net 10/6.

This large-sized Doll has been specially prepared for E. J. A. & Son, Ltd., to enable Girls' Schools to carry out the suggestion in the Board of Education's Circular 758, "*Memorandum on the Teaching of Infant Care and Management in Elementary Schools*," *viz.*:—

"Each girl, when she leaves school, ought to know how to wash and dress a baby; what clothes it should wear, and how to make them."

This Doll is made of wood, enamelled, with movable joints, and will be found to be the best substitute for a real baby, both in size and general build, that can be had.

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This is made of compressed paper pulp, coated with bath enamel, is both light and unbreakable, and has a broad flange to allow of its being carried easily when containing water. It is specially suitable *for home use*, as it never feels cold to the skin, as a metal bath does, nor does it become slippery, like wood.

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The Cot is strong, made of wood, with wire spring mattress. The two sides let down, and the whole article can be unscrewed, and the parts *packed flat*. No more suitable article for teaching girls how to deal with sick children in bed, *e.g.*, in the changing of wearing apparel or bed-linen, could be devised.

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Similar to the "A.L." Model Cot.

Length, 24-in.; Width, 13-in.; Height at head, 17-in.; Height at foot, 15-in.; net 7/6.

FITMENTS FOR MODEL COT AND MODEL BEDSTEAD.

Mattress and Pillow	net	**2/-**
Pillow-case, Calico	,,	**6d.**
Sheets, Bleached Calico	per pair, ,,	**1/3**
Blankets	,, ,,	**2/-**
Counterpane	,,	**1/6**
Down Quilt	,,	**3/6**

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